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THE EXTENT AND INTENSITY OF EXTREME ULTRA-VIOLET SOLAR RADIATION AT CALCUTTA, WITH SPECIAL REFERENCE TO ITS THERAPEUTIC VALUE.*

PROF. P. N. GHOSH, DR. A. C. UKIL, AND MR. M. K. SEN,

From the Department of Applied Physics, University College of Science, Calcutta.

1. INTRODUCTION

From meteorological and biological standpoints, the solar radiation can be broadly divided into three parts: namely, the infra-red, the visible and the ultra-violet. The infra-red portion consists of the longest wave-lengths extending from 30,000A° to near about 8000A°, the visible region starts from 8000A° and ends at about 3800A° and the ultra-violet begins at 3800A° and terminates in the close proximity of 2900A°.

From purely theoretical considerations one would expect that the radiant energy of the sun, a glowing mass at a temperature of near about 6000°K, would extend far into the short wave spectral zone. The radiation, however, experiences a modification in passing through the atmosphere surrounding the earth. In this region, diffusion and absorption play a very prominent part in changing its nature as it passes through this layer. Due to reflection, diffusion and scattering, it suffers a change in direction and distribution, though its main quality is unaltered. It is absorption, however, which is responsible for the modification of its quality. Of the absorbing elements present in the atmosphere it is known that the nitrogen is very feebly absorbing and the absorption of oxygen is confined to a band lying in the visible region. The water vapour is remarkably transparent to the visible and ultra-violet region, but it cuts off a wide range of radiation in the near infra-red portion of the spectrum. The carbon dioxide has an absorption band in the infra-red overlapping to a certain extent with that of the water vapour and extending farther in the same region. It is, however, ozone present in the upper

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layers of our atmosphere which is responsible for the suppression of the ultra-violet short wave-length radiation emanating from the sun. The absorption due to ozone has been found to be extending from a region in the proximity of 2900A° to 2200A°, depending on the depth and density of the ozone layer in our atmosphere situated at a height of about 50 kilometers.

The available solar radiation is thus largely confined to the heat rays of long wave-length, the visible rays with practically one gap, and the ultra-violet, terminating in the close proximity of 2900A°. Besides these gaps in the spectrum due to atmospheric influences, the entire spectrum is traversed by innumerable dark lines, the so-called Fraunhofer's lines indicating the radiations which have already been absorbed before it reaches our atmosphere by the envelope of the sun itself.

From biological considerations, all the three regions have their utilities, but in our present investigation we shall confine ourselves to that portion of the spectrum which has bactericidal properties. As early as 1877, Downs and Blunt[1] recorded the lethal action of sun light. Since then, a considerable amount of work has been done regarding the bactericidal effect, the elaboration of vitamins, the antirachitic action etc. of sunlight. The bactericidal action has been found to be located in the extreme ultra-violet region extending from 3300A° to 2900A°.

2. Experimental Methods for Measuring the Ultra-violet Radiations

For the measurement of the intensity of radiation, bolometer was used by the earlier investigators. The photo-electric cell was evolved by Elster and Geitel[2] and has been utilised by Kron and Dember in their investigations. This has also been used systematically by Dorno[3] and his collaborators at Davos. The cadmium photo-electric cell, standardised in his laboratory, has been adopted by a large number of investigators on the continent. The thermo-couple galvanometer and the radiometer were perfected by Coblentz[4] in America and an extensive series of investigations regarding the intensity of ultra-violet radiation has been conducted by him and his associates. And finally, the photo-chemical methods have largely been used in England by Hill[5] and also by a large number of workers in different parts of the world.

From these investigations a large amount of data has been collected and it is now known that besides the ultra-violet content of direct sunlight the scattered radiations from the blue sky bear a fair proportion of the total ultra-violet intensity (Hill 1929). Coblentz and Stairs[6] (1931) found that the ultra-violet rays suffer a great deal of reduction in intensity due to atmospheric pollution from dust, smoke etc., giving rise to wide diurnal and seasonal variations and that the intensity is maximum at noon time during the day and the ultra-violet content of sun light reaches its maximum during the month of July in America. He also found that the intensity of ultra-violet region is stronger at high altitudes than at the sea-level.

We have very little information in India regarding the extreme ultra-violet solar radiation, in spite of the fact that we have abundant sunshine throughout the year. The earliest record is by Suring[7] at Agra in 1924 with the cadmium photo-electric cell and by Mukherjee, Boyd and Bose[8] at Calcutta in 1930. The latter authors first tried the acetone methylene blue method of Hill but abandoned it in favour of oxalic acid uranyl sulphate method of Anderson and Robinson[9].

Regarding the suitability of the above mentioned methods for the measurement of intensity in a definite region of the solar radiation, it may be pointed out, that the photoelectric cell is highly sensitive, but its action is spread over a fairly wide region of the ultra-violet spectrum. It further requires constant calibration against a standard to secure comparable results. The radiometer or the thermo-couple galvanometer is non-selective and it is affected by the entire spectral region. For a study of the intensity of any particular region, one has to insert filters to cut off the undesired portion. The types of filters used by different workers are more or less arbitrary and it is not possible to secure a filter which would only allow the extreme ultra-violet region to pass through it unaffected and cut off the rest of the spectrum entirely. The photo-chemical method is the simplest in operation, but besides the fact, that its effect is spread over a zone of radiation it has been found that the absolute purity of the chemicals is an essential factor in arriving at concordant results.

It is evident from the above considerations that none of the methods, so far used, is capable of evaluating accurately the energy of the aforesaid biologically active region of the spectrum uniquely. It would, therefore, be of interest to devise a method by which it would be possible to accurately determine the intensity of sunlight in this biologically active region. Such a method should be based on a standard which could be reproduced in any well organised laboratory and would not suffer from the drawback of calibration and standardisation according to some arbitrary standard.

3. Present Investigations

In the present investigation a photographic photometric method has been evolved not only to determine the intensity of the extreme ultra-violet, biologically active, solar rays but to ascertain in what manner the extent of these radiations is modified during the course of a day as well as for the different months of the year at Calcutta.

It is well known that the ordinary photographic plate is highly sensitive to the ultra-violet rays and one would naturally think that if the spectrum of sunlight is recorded on a photographic plate, it would be possible to ascertain the intensity of the radiation, from the relative blackening of the different zones. It is needless to mention that as glass absorbs ultra-violet rays, a quartz dispersive system which is transparent to ultra-violet radiation up to 1800A° has to be used for the production of the spectrum. Until quite recently the actual estimation of intensity from the photometric measurement of the blackening of a plate was beset with uncertainties and this procedure, though the simplest, was not adopted for this purpose. Many of the difficulties of this method have now been overcome and the spectro-photometric method is at present widely used by spectroscopists for the comparison of intensities of line and band spectra. The method resolves itself into two operations. The first operation consists in taking spectrograms of the desired radiation along with that of a standard source and the second consists in securing a measure of the degree of blackening produced in the different spectral regions by the two sources as well as the evaluation of the characteristics of the plate in the aforesaid regions.

(i) *Theoretical considerations for the measurement of intensity of radiation*

The theory underlying the determination of the intensity of radiation from the blackening produced by it on a photographic plate has been fully worked out by Ornstein[10] and his collaborators. It is briefly as follows:—

The degree of blackening of a photographic record would depend on two factors, *viz.*, the nature of emulsion and the intensity of the radiation to which it is exposed. If we specify the intensity of a standard source as "l_o", and that of the unknown radiation by "l_x" and the relative blackening produced by the two radiations by "B", from the law of absorption one gets the following relation,

$$B = C \log l_x/l_o$$

where "$\log l_o$" is a constant of the plate determining its sensitiveness for the radiation of definite wavelength and "C" the contrast factor for the plate.

One has thus to adopt a procedure to ascertain the measure of blackening "B" and also get a measure of the constant "log l " for sensitiveness of the record on the plate and also for "C". And then

$$\log l_x = B/C \times \log l_o$$
$$\text{or } l_x = eB/C \times \log l_o$$

(ii) *Measurement of Blackening of Plates.*

An unexposed photographic plate, when properly fixed, washed and dried, would only have the gelatine emulsion on it. Such a plate would indicate the maximum transmission value when examined with a micro-photometer (to be described later). A plate exposed to the spectrum of any source of radiation, when properly developed, fixed, washed and dried, would show a record with definite blackening. So that a photographic plate which has a portion of it unexposed, a portion exposed to the spectrum of unknown source would on examination with a microphotometer show different transmission values.

If D_m is a measure of the transmission through unexposed portion,

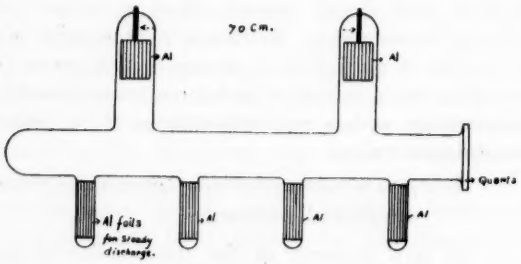
D is a measure of the transmission through unknown source,

the measure of blackening of the portion exposed to unknown radiation is $B = \log D_m/D$.

(iii) *The Standard Source of Ultra-violet Radiation and the Intensity Unit.*

As a standard for ultra-violet radiation the quartz mercury vapour lamp, tungsten arc, carbon arc, iron arc have often been used. The main objection regarding the use of these sources is, that all of them emit discrete line spectrum. For instance, the mercury arc has only 4 lines of moderate intensity (3131A°, 3125A°, 3085A°, 2967A°) in this region. So the suitability of arcs as a standard is hardly justifiable. The use of incandescent lamps is primarily beset with the difficulty namely that glass bulbs can not be used and even with quartz bulbs the intensity of the source will gradually diminish with time, owing to the sputtering action of the filament. A continuous source of radiation would thus be a suitable standard. A hydrogen discharge tube has been found to be most suitable for this purpose. It is a glass tube about a meter long with an internal diameter of one inch. Two electrodes are of stout aluminium sheets rolled in tubular form and placed 70 cm. apart. One end of the tube is sealed, and to the other end is fitted a quartz plate to allow the ultra-violet radiations to pass through it. To prepare the tube, it is first thoroughly exhausted and carefully heated to remove occluded gases and high potential discharge is passed through the tube to heat up the walls and liberate the gases. Finally, pure dry hydrogen gas is introduced in it at a pressure of 10 mm. The tube is excited at 3000 volts, and about 100 milliamps current passes through it and then it emits continuous radiation from visible up to the extreme ultra-violet zone free from any discontinuity. (Fig. 1).

FIG. 1



One great advantage of this discharge tube is that light emitted by it can be visually compared with any photometric standard such as 10 C. P. Pentane lamp (British standard) or amyl acetate Hefner lamp (German standard). The visual calibration is further compared with the microphotometric records of spectra taken with the visual Photometric standard normal 10 C.P. Pentane lamp and the discharge tube and in the yellow green region the agreement is within about 1%. The intensities, as determined from microphotometric records in the different regions of the spectrum, are also found to be quite proportional.

The intensities of the lines from a normal iron arc in the ultra-violet region was also measured and were found to be mantained at a definite value provided the voltage at the terminals of the arc and the current passing through it are maintained constant.

THE INTENSITY UNIT*

The ultra-violet intensity unit would be that corresponding to the radiation from a hydrogen discharge tube, specified above, placed at a distance of one meter from the object.

(iv) *Measurement of the Transmission Values of Plates.*

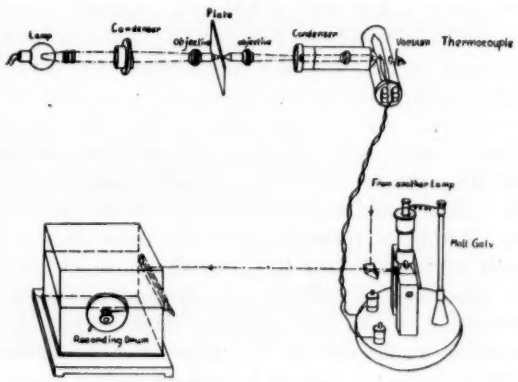
The apparatus by which a point to point record of the transmission values of a photographic plate can be secured is known as a microphotometer. In our investigations we have used the Moll microphotometer. The photographic plate to be examined is placed in a holder mounted on an optical bench. The plate holder can be moved crosswise to the bench. A small filament lamp fed from a 6 volt battery is mounted on the same bench. A condenser and a miscroscopic objective produces a small point source of light on the photographic plate. On the other side of the plates a similar microscopic objective and condenser serve to focus the transmitted ray on the surface of a vaccum thermocouple mounted on the same bench. The thermocouple is

*In a recent communication (*Journal of Scientific Instrument*, May, 1935) W. J. H. Moll, H. C. Burger and W. T. Reichert have described a set of instruments for measuring spectral absorption. In this paper the authors have adopted the identical arrangement as used by the present authors and also point out the suitability of hydrogen discharge tube as a standard source of ultra-violet radiation. In this paper, however, the authors discuss the arrangement as suitable for ultra-violet absorptive power of liquids.

connected with a very sensitive dead beat galvanometer designed by Moll. The light from another lamp passing through a circular diaphragm is reflected by the mirror of the galvanometer and forms a point image on the sensitive photographic paper wrapped on a rotating drum. The drum is enclosed in a light tight box and there is a long narrow slit on one side of the box parallel to its axis which allows the reflected light from the galvanometer to act on the sensitive paper. The most ingenious part of the instrument, however, is the arrangement by which the cross-wise motion of the plate-holder serves to rotate the drum about its axis. With the help of precision gearing, one can get the motion of the plate magnified several times. Thus, one mm. motion of the plate can produce several cm. travel of the sensitive paper on the drum.

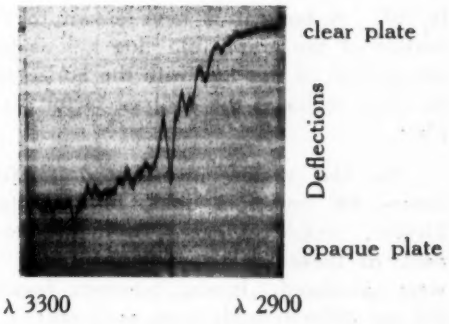
The optical arrangement of the microphotometer is shown in Fig. 2.

FIG. 2



The plate with the spectral records is put on the plate-holder of the microphotometer and the zone to be investigated is brought in the line of the bench. The point image of the bench lamp is next focussed on the definite line of the spectrum and it is slowly moved crosswise to the bench till the other limit of the zone is reached. This produces deflections of the galvanometer according to the density of the record. These deflections are photographically recorded on the sensitive paper wrapped round the rotating drum. The transmission through the unexposed plate evidently produces the maximum deflection of the galvanometer and the opaque portion from the datum line for the deflections. A typical photometer record is shown in Plate I. The datum line and the maximum deflection lines are shown in the record.

PLATE I



(V) Measurement of the Plate Sensitiveness and Contrast Factor.

As previously explained, a microphotometric measurement enables us to evaluate the degree of blackening of the plate. To determine the intensity of radiation, the plate factors, *viz.*, the sensitivity "log I " and the contrast factor "C" have also to be evaluated. It is hence necessary to secure a series of spectral records of different intensities of the standard source. Five slits of different widths were fitted on a diaphragm which was then mounted before the slit of the spectrograph and the spectral records of the hydrogen discharge were taken on the plates. The discharge tube was placed at a distance of one meter in front of the slit. It is clear that the intensity of radiation incident on the plates is proportional to width of slit openings.

The photographic record was next examined with the microphotometer and the transmission factors for the different spectral records were ascertained.

The blackenings corresponding to the different slit widths for 3150A° are as shown below:

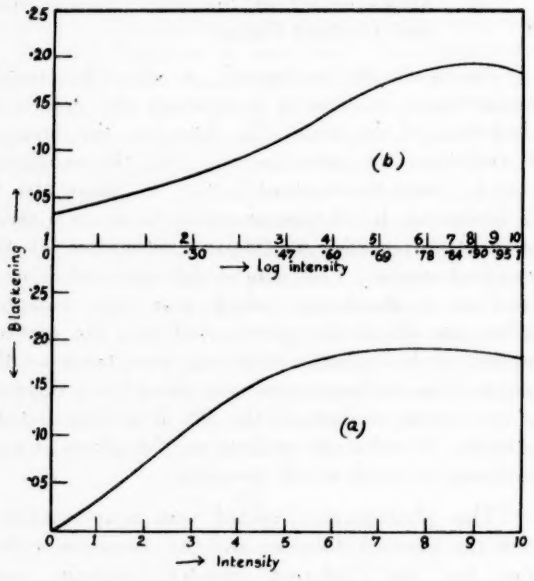
TABLE I

SLIT WIDTH in mm.	BLACKENINGS
0·1	0·060
0·25	0·093
0·40	0·152
0·60	0·187
1·00	0·187

A graph is next drawn showing the relation between the blackening and intensity for the wavelength 3150A°. From this graph a second graph is plotted with blackenings as ordinates and logarithms of intensity as abscissa. This is shown in Fig. 3 (a, b). A tangent is next drawn to the straight portion of the graph (b). "log I_0" is the point of intersection of this line with the horizontal axis and its slope indicates the contrast factor " C " for the plate.

As the region investigated (3300A°-2900A°) covers 400 angstrom units, four points, (3200A°, 3100A°, 3000A°, 2900A°) were selected and for each of these points, "log I_0" and "C" values were calculated. It was, however, found that they did not differ sensibly from each other.

FIG. 3



Further, one plate from each packet used in this investigation was specially used for the purpose of testing the sensitivity and contrast value according to the procedure stated above and it is interesting to note that for Ilford "Empress" plates, used by us, the variations have been found to be within the limits of experimental error. The mean values of "log I_0" and " C " were therefore used to determine the values of intensities of the solar radiation from typical plates taken on clear days of each month of the year.

From the theoretical considerations as well as from the experimental arrangements adopted in this investigation, it is clear that it has a decided advantage over the methods so far used to evaluate this important constant. It is possible to select any definite zone of the spectrum and evaluate its intensity in terms of a reproducible standard. The equipment for use according to this method is now available in any well equipped laboratory. In fact, the spectral records may be taken with a quartz spectrograph of moderate dispersion any where. The plates may be developed under controlled conditions in the laboratory, provided they are properly packed after exposure. The sensitiveness and contrast factor of the plates may be evaluated from an unexposed plate from the same batch.

A. The Limit of the Ultra-violet Radiation at Calcutta

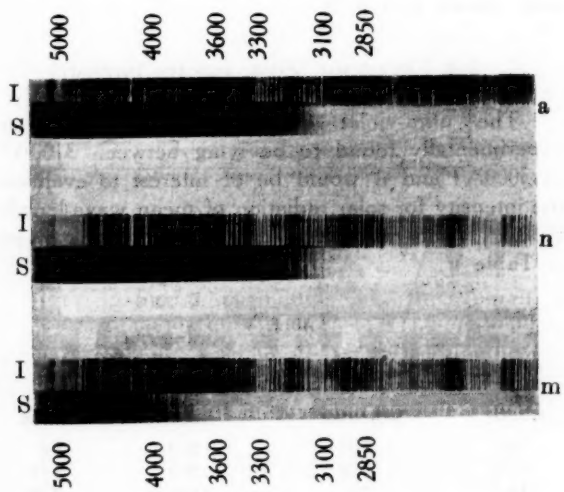
In the present investigation, the spectrograms have been taken with a Hilger E_3 Quartz Spectrograph. The spectrum from 5000A° to 1800A° was recorded on an ordinary quarter-size photographic plate. The comparison spectrum was that of a normal iron arc as specified by the Astronomical Solar Union. The spectrograph was so disposed that the rays were always normally incident on its slit. This would evidently require a type of mounting capable of rotation about the polar axis of the earth so as to follow the diurnal course of the sun. To avoid this, a heliostat was set up in front of the instrument. As the ordinary glass mirror of the heliostat would cut off the ultra-violet radiations, a suitable reflector has to be substituted in place of the glass mirror. On an examination of the literature regarding the reflecting powers of metallic mirrors it was found that silver mirrors absorbed a considerable amount of ultra-violet radiations, whereas mirrors of aluminium, chromium, nickel and steel had good reflecting powers. The so-called "non-rusting steel" is an alloy of steel, nickel and chromium and mirrors of this material have been found to be very good reflectors for ultra-violet radiations. A "non-rusting steel" mirror was hence substituted in place of the glass mirror of the heliostat. A spectrum of the normal iron arc and one taken after reflection from this mirror were next examined according to the method described before and it was found that, for all practical purposes, the

intensities of the lines in the ultra-violet regions of the spectrum were identical.

Ilford "Empress" plates were used for the spectrograms and they were developed with the standard developer recommended by the manufacturers. The process of developing, fixing and washing was conducted in a special chamber maintained at 67°F. which not only yielded the best contrast, but ensured the uniformity of treatment for all the plates used in this work.

A typical photograph showing the variation of the extension of the ultra-violet rays is given in Plate II. From fig. 4, it is clear that the limit is

PLATE II



λ in A° units

S—Solar Spectrum; I—Iron Spectrum;
m—morning, n—noon, a—afternoon (3 p.m.)

TYPICAL SOLAR SPECTRUM
(Extent in different parts of a day)

shifted during the course of a day, the maximum being found for about three hours of the noon time, declining in the morning as well as in the evening. The limit also undergoes variation from month to month in a year reaching the maximum in July.

FIG. 4

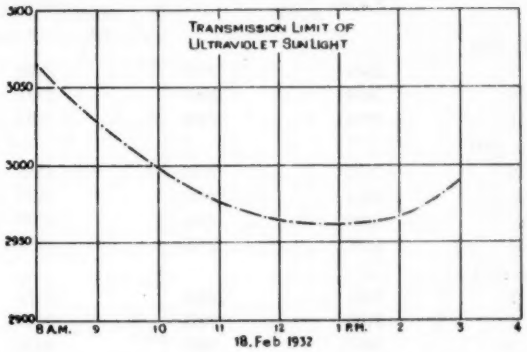


Table II shows the extent of the short wave-length for each month from August, 1931 to July, 1932. This is taken as the average from the records taken on clear days of each month. The average for cloudless days for each month is shown in Table III.

TABLE II

MONTHS	MORNING (8 A.M.) λ IN A°		12 NOON λ IN A°		AFTERNOON (3 P.M.) λ IN A°
Aug.	3085	...	2980	...	3160
Sept.	3085	...	2980	...	3440
Oct.	3080	...	2970	...	3380
Nov.	3080	...	2965	...	3150
Dec.	3080	...	2965	...	3120
Jan.	3140	...	2965	...	3010
Feb.	3075	...	2960	...	2990
Mar.	3035	...	2950	...	2990
Apr.	3025	...	2950	...	2990
May	3010	...	2945	...	3005
June	3000	...	2945	...	3000
July	3000	...	2940	...	2990

TABLE III

Extent of the shortest wave-length in the spectrum for clear days throughout the year.

(From August 1931 to July 1932).

MONTHS	MORNING 8 A.M.		NOON 12		AFTERNOON 4 P.M.
Aug. 1931					
14	3057	...	2965	...	3200
15	3100	...	2037	...	3151
21	3009	...	2965	...	3075
23	3151	...	2965	...	3166
Sept. 1931					
14	3057	...	2959	...	3440
15	3009	...	2959	...	3440

MONTHS	MORNING 8 A.M.	NOON 12	AFTERNOON 4 P.M.
Oct. 1931			
7	3004 ...	2959 ...	2965
10	2000 ...	2959 ...	2987
11	2994 ...	2959 ...	2994
Nov. 1931			
16	3057 ...	2965 ...	3100
25	3075 ...	2965 ...	3125
27	3100 ...	2965 ...	3209
28	3067 ...	2965 ...	3151
Dec. 1931			
3	3083 ...	2965 ...	3025
4	3100 ...	2965 ...	3016
5	3057 ...	2965 ...	3026
7	3083 ...	2959 ...	3009
Jan. 1932			
4	3100 ...	2965 ...	3009
5	3248 ...	2965 ...	3009
6	3100 ...	2965 ...	3009
8	3100 ...	2959 ...	3009
Feb. 1932			
1	3100 ...	2965 ...	3009
2	3100 ...	2965 ...	3009
10	3083 ...	2959 ...	2994
11	3057 ...	2959 ...	2987
17	3057 ...	2959 ...	2973
18	3057 ...	2959 ...	2973
March 1932			
3	3100 ...	2947 ...	3026
10	3016 ...	2947 ...	3026
11	3026 ...	2947 ...	3026
23	3026 ...	2947 ...	3009
April 1932			
7	3016 ...	2947 ...	3009
8	3016 ...	2947 ...	3009
9	3009 ...	2947 ...	3026
21	2994 ...	2947 ...	3009
22	2994 ...	2947 ...	3009
May 1932			
11	2994 ...	2947 ...	3008
12	2994 ...	2947 ...	3008
19	2973 ...	2947 ...	3016
20	2973 ...	2947 ...	3016
21	2994 ...	2958 ...	3021
June 1932.			
15	3009 ...	2947 ...	2994
17	3009 ...	2947 ...	2994
20	3009 ...	2959 ...	3016
30	2980 ...	2953 ...	2994
July 1932			
5	2994 ...	2947 ...	—
9	2994 ...	2947 ...	—
18	3009 ...	2947 ...	—

**(Records of the afternoons are untrustworthy as the evening sky was very dull and dustladen).

B. The measurement of the Intensity of the Extreme Ultra-violet Radiations at Calcutta

For the measurement of the intensity, typical spectral records taken on cloudless days of each month of the year August 1931 to July 1932 were examined. Values of blackenings for ten wave-lengths within the zone 3300A° to 2900A° were calculated, the contrast factor "C" and the sensitivity factor "log I_o" were also ascertained in terms of the standard ultra-violet source. The actual intensities were finally ascertained according to the relation discussed before. The results are shown in Table IV (given at the end of the paper). To bring out clearly the variation of intensity during morning, noon and afternoon, three graphs have been plotted from the monthly records and these are given in Figs. 5, 6, 7. The mean intensity, for the wave-length 3050A° has also been worked out and graphically shown in Fig. 8.

C. The Erythemal Zone and its Intensity

The ultra-violet erythemal zone has been experimentally found to be lying between 3100A° to 3000A° and it would be of interest to evaluate the intensity for solar radiation of mean wave-length 3050A°. This value was determined and is given in Table V.

Table V

Intensity of Erythemal Zones

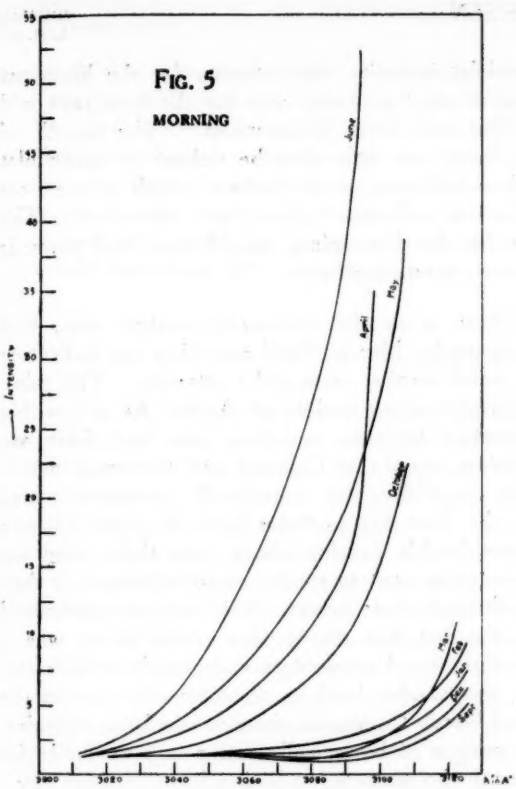
MONTH	MORNING.	NOON	AFTERNOON
Jan.	— 1·51 ...	16·0 ..	5·0
Feb.	— 1·58 ...	28·0 ...	5·74
Mar.	— 2·1 ...	114·5 ...	3·18
Apr.	— 3·2 ...	280·0 ...	3·36
May	— 4·6 ...	14·7 ...	5·6
June	— 7·58 ...	562·3 ...	19·5
July	— 6·8 ...	139·5 ...	8·5
Aug.	— 3·38 ...	75·0 ...	4·6
Sept.	— 2·35 ...	35·0 ...	4·25
Oct.	— 2·98 ...	16·5 ...	4·0
Nov.	— 1·78 ...	16·2 ..	4·0
Dec.	— 1·6 ...	16·2 ...	4·0

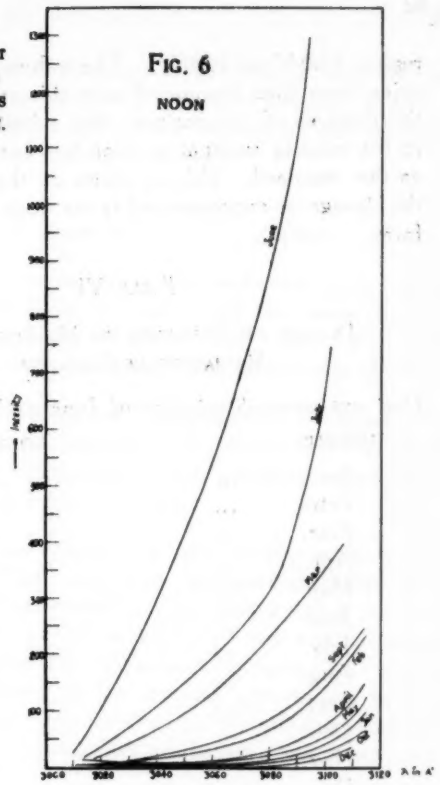
D. The Ultra-violet Dosage

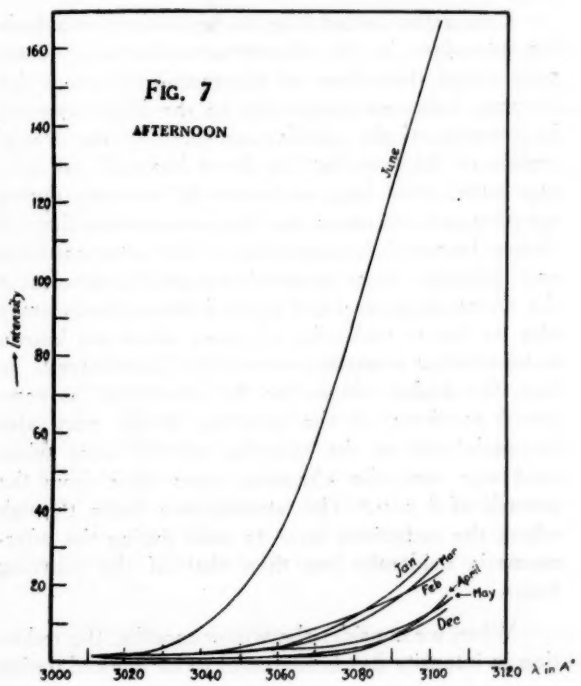
The utility of this investigation would not, however, be complete without an estimation of the integral effect of the radiation distributed over this

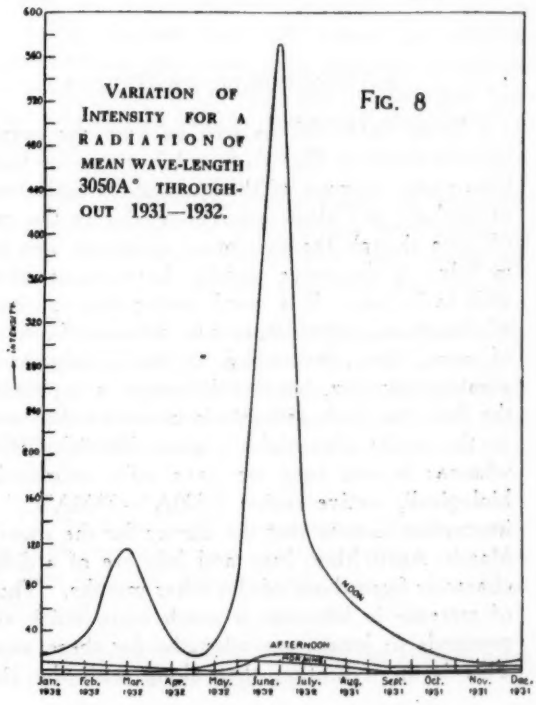
FIGS. 5, 6, & 7

INTENSITY OF DIFFERENT ULTRAVIOLET RADIATIONS FOR DIFFERENT MONTHS OF THE YEAR 1931—1932.









region 3300A° to 2900A°. The values of the intensities were thus integrated over this region and for the purpose of comparison, five minutes' exposure to the midday sunlight in June has been considered as the standard. This is taken as the measure of the dosage of exposure and is set down in a tabular form.

TABLE VI

DOSAGE OF EXPOSURE TO MIDDAY SOLAR RADIATION AT CALCUTTA

Unit exposure—5 minutes of June midday sunshine

MONTHS	DOSAGE IN MINUTE
Jan.	176
Feb.	100
Mar.	25
Apr.	—
May	—
June	5
July	20
Aug.	—
Sept.	80
Oct.	400
Nov.	450
Dec.	700

4. DISCUSSION OF THE RESULTS

From Table IV, as well as from the graphical records shown in Figs. 5, 6 and 7, it appears that the ultra-violet intensity of the biologically active region of sunlight at Calcutta is highest during the month of June though the maximum extension was found in July. It decreases rapidly, however, in May as well as in July. It is worth noting that the findings of American investigators are different from those of ours, since, according to them, July has the greatest intensity, but this difference is explained by the fact that their estimate is based on the intensity of the entire ultra-violet region (3800A°—2900A°), whereas in our case we have only estimated the biologically active region (3300A°—2900A°). It is interesting to note that the curves for the months of March, April, May, June and July are of a different character from those of the other months. The rate of increase in intensity is much more quick as one proceeds to longer wave-lengths for these months. This is an indication that along with the rise of ultra-violet intensity, the intensity for the luminous region or most probably also for the heat rays will be more and more pronounced. The month of June would not only thus be richest in ultra-violet but it would also be the hottest month of the year so far as radiation values are concerned. The curve for April mornings would also lend towards the same interpretation.

There is another noticeable feature *viz.*, that the curves for March, April and May are indicative of a much weaker ultra-violet intensity. The minimum occurred in middle of April. As a possible explanation for this, one may note that these are the driest months at Calcutta and the wind movements, specially the occasional norwesters, may carry the finer dust particles from the surface layers to considerable heights above, and these may act as scattering centres to the solar radiation as they pass through these layers. This is clearly in accord with the fact that during this period there was a large number of norwesters and squalls at Calcutta. This would also lead us to infer that during the period March to August, there would be a considerable portion of biologically active rays available for use from the scattered radiation from the blue sky.

During the period May to September, one finds the intensities in the afternoon to be much more pronounced than those of the morning, though this increase bears no proportion to the large increase in intensity of the midday sunshine. This is suggestive of the fact that the direct beam of the solar rays suffer very large reduction in intensity during morning and afternoon due to their passage through deeper layers of the atmosphere, owing to scattering and diffusion, from suspended particles present in the atmosphere, and that part of this reduction may also be due to molecules of gases which are known to be efficient scattering centres for short waves. In fact, the higher values for the afternoon, as compared to those of the morning hours, may also be explained, as the morning records were taken at 8 a.m. and the afternoon ones were from the records of 3 p.m. The atmospheric layer through which the radiations have to pass during the afternoons is evidently less than that of the morning hours.

When we consider the winter months, the reduction in intensity has been found to be marked during

mornings. In a crowded commercial city like Calcutta, with its large number of small house-fires one can reasonably comprehend that the smoke arising during the early morning hours would spread over the lower layers of the atmosphere and would serve as very efficient scattering centres. If the records were taken in the late afternoons, the effect would have been still more pronounced.

5. The Scope of the Investigation

In this preliminary investigation regarding the intensity of solar radiation we have confined ourselves only to the biologically active extreme ultra-violet region. No attempt has been made to investigate about the intensity of the visible or the thermal region. It should, however, be pointed out that for the proper utilisation of the beneficial action of sunlight on the human system, it would be necessary to undertake a series of investigations regarding the intensity of the other zones. It is well known that the thermal radiations react harmfully on the human system. In tropical regions, where the intensity of the solar heat rays is much higher than in the temperate climes, the estimation of the energy in the thermal region along with that of the extreme ultra-violet, would be of supreme importance if we want to secure the beneficial effect of sunlight by the exposure of the human body to solar radiation. It is only by a careful and systematic enquiry one can ascertain the time of the year and the period of the day which would be the most suitable for the purpose. With the new infra-red plates it would be possible to apply the methods of photographic photometry, with suitable spetcrographic equipment, as far as 1 μ a region of the solar radiation where the thermal effect is well pronounced.

Further, it would be of importance to undertake the estimation of intensity of the biologically active rays for different parts of India and more specially for the different hill stations, where, owing to higher altitudes and clearer atmosphere, one would expect to find a higher intensity for the ultra-violet rays and where the cooler surroundings would check the harmful effects of the heat rays to a considerable extent.

Regarding the selection of sites for sanatoria in hill stations one can not lay too much stress on this factor. Unfortunately at present no data are available for these hill stations of India and it is well worth drawing the attention of scientific workers to this aspect of study.

6. Summary and Conclusions

1. The character of solar radiation in its various aspects has been discussed and the importance of investigating the intensity of the biologically active zone of the sunlight has been pointed out.

2. The different experimental methods for measuring the intensity of ultra-violet radiations have been discussed and their advantages and drawbacks, have been set forth.

3. A new method *viz.*, the "photographic photometric method" has been discussed from the theoretical and experimental view points and it has been shown that, by the adoption of this method alone, it will enable one to secure a quantitative measure of the intensity of the extreme ultra-violet, biologically active, solar radiation. A suitable standard source for ultra-violet radiation has also been suggested.

4. For the first time, the extent and intensity of the extreme ultra-violet solar radiation at Calcutta has been accurately determined. The data have been collected in tabular form and graphically represented.

5. For the first time, the intensity of erythemal zone of the sunlight at Calcutta has been evaluated and the ultra-violet dosage for the biologically active radiation at Calcutta has been determined.

6. The results of the investigations have been fully discussed and it is found that the intensity is maximum in June. The effect of norwesters on these radiations has been pointed out and the ultra-violet intensity during the winter months has been discussed.

7. The scope and importance of the investigation have been discussed. The importance of securing data for the different hill stations has been pointed out.

8. A complete bibliography of the literature on the subject has been collected.

TABLE IV.

Intensities of the Ultra-violet Solar Radiation at Calcutta from September, 1931 to July, 1932. (Morning, Noon and Afternoon).

MONTHS	MORNING		NOON		AFTERNOON	
Sept. —	3103	2·69	3101	147·9	3092	8·70
	3096	2·29	3094	128·8	3075	5·49
	3085	2·08	3076	77·6	3072	5·75
	3079	1·51	3070	56·2	3052	3·38
	3071	1·48	3055	51·3		
	3058	1·38	3041	5·25		
	3051	1·35	3028	4·26		
	3046	1·35	3011	2·45		
	3026	1·35				
Oct. —	3105	17·8	3106	38·0		
	3092	9·12	3092	17·8		
	3083	7·24	3085	17·8		
	3061	4·26	3075	13·8		
	3055	3·38	3061	10·9		
	3039	2·14	3052	6·92		
	3022	1·38	3042	8·13		
	3013	1·38	3037	6·45		
			3035	5·75		
			3016	2·29		
Dec. —	3100	1·44	3091	7·08	3099	6·91
	3090	1·38	3081	7·08	3091	6·02
	3078	1·38	3072	7·76	3082	5·45
	3072	1·35	3057	4·89	3067	3·55
	3056	1·28	3052	3·05	3058	2·51
	3044	1·28	3040	3·71	3047	2·34
	3025	1·28	3028	2·75	3039	1·90
	3016	1·28			3026	1·51
					3018	1·38
Jan. —	3099	1·78	3102	38·0	3100	16·6
	3092	1·78	3093	38·0	3092	16·6
	3087	1·78	3081	56·2	3081	19·5
	3082	1·62	3073	56·2	3073	19·5
	3078	1·62	3063	29·5	3065	9·12
	3072	1·58	3053	15·5	3059	4·67
	3065	1·51	3040	17·8	3046	5·25
	3058	1·48	3033	14·4	3040	3·71
	3052	1·51	3028	11·7	3036	3·16
	3046	1·58	3018	13·8	3028	3·38
	3036	1·58	3011	7·60	3021	2·04
	3032	1·58	3009	2·75	3016	1·38
	3021	1·58				
Feb. —	3105	3·80	3106	169·8	3107	16·9
	3098	3·02	3101	56·2	3098	16·9
	3088	3·02	3090	128·8	3089	21·4
	3075	2·04	3084	169·8	3076	10·9
	3066	1·78	3075	45·7	3067	7·24

MONTHS	MORNING		NOON		AFTERNOON	
Feb. (Contd.)	3055	1·62	3066	29·5	3056	7·24
	3050	1·58	3056	31·6	3047	5·01
	3046	1·51	3048	26·9	3032	1·90
	3039	1·48	3045	38·0	3015	1·58
	3034	1·28	3037	26·9		
	3026	1·38	3032	15·5		
	3018	1·38	3028	6·02		
			3014	6·02		
Mar. —	3106	4·46	3104	269·1	3102	21·4
	3105	3·55	3097	269·1	3095	17·8
	3103	3·38	3087	316·2	3084	17·8
	3100	1·86	3071	169·8	3070	6·91
	3099	1·51	3064	100·0	3064	3·80
	3096	1·38	3053	128·8	3052	3·38
			3047	100·0	3044	2·29
			3044	87·1	3031	1·62
			3036	100·0	3027	1·44
					3020	1·62
					3015	1·48
Apr. —	3098	24·5	3095	51·3	3005	19·5
	3090	19·5	3087	51·3	3097	6·90
	3080	22·9	3077	63·1	3088	5·75
	3063	5·01	3063	38·0	3079	5·75
	3058	3·71	3054	26·9	3072	5·50
	3039	2·45	3043	31·6	3064	3·16
	3019	1·51	3034	21·4	3056	2·45
			3016	6·45	3045	2·29
					3034	1·86
					3016	1·38
May. —	3101	31·6	3107	70·8	3105	16·9
	3087	13·8	3097	26·9	3096	6·45
	3080	11·7	3089	29·5	3088	5·75
	3072	13·8	3080	34·6	3079	6·02
	3058	6·91	3065	22·9	3073	6·02
	3052	4·46	3062	29·5	3066	3·38
	3044	4·26	3057	15·5	3058	2·34
	3039	3·16	3047	14·4	3049	2·34
	3035	2·95	3040	14·4	3040	1·78
	3029	2·75	3036	13·8	3032	1·78
	3020	1·69	3029	14·4	3026	1·57
	3014	1·51	3025	9·12	3021	1·35
			3019	4·26	3014	1·38
			3013	9·12	3011	1·38
June. —	3101	50·1	3101	1096·5	3102	138·0
	3093	40·7	3093	851·1	3094	112·2
	3082	45·7	3084	1230·3	3076	128·8
	3068	15·5	3068	691·8	3070	45·7
	3062	8·71	3061	457·1	3962	21·4
	3051	7·58	3050	562·3	3051	19·5
	3044	4·46	3042	316·2	3042	9·55
	3025	1·69	3034	380·2	3030	4·26
	3015	1·58	3028	199·5	3024	2·08
			3024	51·3	3013	1·78
			3012	77·6		

		NOON	
July.	3106	...	691·8
	3092	...	316·2
	3084	...	316·2
	3075	...	562·3
	3063	...	229·0
	3055	...	128·8
	3046	..	147·9
	3037	...	100·0
	3030	...	112·2
	3021	...	17·8
	3011	...	24·5

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PROGNOSIS OF TYPHOID FEVER:

A STUDY BASED ON THE CLINICAL OBSERVATION OF ONE HUNDRED CASES

BIDHUBHUSAN BHATTACHARYA, M.D.,

Physician to the Outpatients' Department, Carmichael Medical College Hospitals, Calcutta.

Typhoid fever is a wellknown disease at the present day. Within the last two decades it has been so widespread even in the villages that practically not a single family has escaped from the ravages of this fell disease. The causes of its spread are many and the question of 'healthy carriers' deserves more than a passing notice.

Of the 100 cases of fever, clinically diagnosed as typhoid fever, that I have followed, about 60 cases began with the usual onset, fever gradually rising higher and higher from the date of onset. Sometimes the first 2 or 3 days were not counted as febrile days, rather days of malaise and ill being; another 20 cases began in such a way that for the first week or 10 days they were considered as cases of influenza, with some nasal and respiratory catarrh and pain in the limbs and the remaining 20 cases were very misleading in their onset as to the nature of the illness. 4 cases started with a complication of the respiratory system as lobar pneumonia, 10 cases as typical malaise with shivering, headache, pain in the limbs, with wide range of temperature (between 99°F.—103°F.) and perspiration, the temperature becoming high continued from the 5th or 6th day; 2 cases started with high continued fever with a generalised rash simulating urticarial rash and in other 4 cases the temperature was intermittent in character for the first 5 or 6 days, afebrile for the next 2 or 3 days and then it was of the remittent type. Of the 4 cases beginning with respiratory complications it is worth mentioning that all were seen in families already infected with typhoid, several members being laid down with typhoid fever at that time.

Of the 60 cases of typical onset, 35 showed wellmarked toxic manifestations. There were 16 deaths, 4 died of toxaemia, 2 from perforation, 4 cases developed pneumonia as complication during the course but 1 died of pulmonary oedema, and 9 died of intestinal haemorrhage.

Of the 20 cases of influenzal type of onset, 6 cases developed pneumonic complications. There were altogether 6 deaths, 5 from intestinal haemorrhage and 1 from toxaemia.

Among the 4 cases who had pneumonia at the onset 2 died of pulmonary oedema. All of them showed signs of severe toxaemia.

Of the remaining 16 cases of a very atypical and irregular onset 6 died, 4 from intestinal haemorrhage, 1 from perforation and 1 from toxaemia.

So that from these facts it is seen that cases beginning with atypical onset are prognostically worse subjects than those with typical onset. Cases which begin with influenzal signs are more prone to intestinal haemorrhage than others.

I think the greater death rate in the atypical cases are due to want of proper care and rest in bed and non-restriction of solid food during the early stage of the disease.

Looking to the age incidence of typhoid fever the largest number of cases were seen during the period between 8—16 years and the next largest in children below 8 years of age. Of the 100 cases under my observation 39 cases occurred between 8—16 years and 27 below 8 years, 15 cases between 17—24 years, 13 cases between 25—44 years and 6 cases above 45 years of age. It is worth mentioning here that of the 6 aged patients one was of 73 and another of 70 years of age and although they were desparately ill for sometime all of them recovered. The following chart shows the relations of the age with incidence and death rate according to the onset of the disease as well as the causes of death in different ages. One peculiarity is noticed that none of the aged patients died but I think that is a mere chance and not a proof of absolutely favourable prognosis in old subjects.

Altogether 30 patients died out of 100 cases. Although the percentage of death seems to be too high in comparison to the present day statistics, which gives about 12 to 15 or 20% as death rate in typhoid cases, my observation covers the last 10 years during which period at times the virulence of the infection was higher than that at other times; moreover many of these cases were seen in villages

Age	Below 8 yrs		8—16 yrs		17—24 yrs		25—44 yrs		Above 45 yrs	
	M	F	M	F	M	F	M	F	M	F
No. of Cases	14	13	23	16	6	9	5	8	6	0
No. of Deaths	7	5	2	4	3	3	2	4	0	0
Typical onset (60)	10	8	13	10	4	6	2	3	4	0
Death	4	4	0	2	2	1	2	1		
Influenzal onset (20)	2	4	5	2	1	1	2	3	0	0
Death	2	1	0	0	0	1	0	2		
Pneumonic onset (4)			1	2	1					
Death				1	1					
Malarial onset (10)	2		3			1	1	2	1	0
Death	1		1					1		
Pyrexial onset (2)				1					1	
Death				1						
Atypical (4)		1	1	1		1				
Death			1			1				
Death from Haemorrhage (18)	5	2	2	2	2	1	1	3		
Perforation (3)	2						1			
Pulm. Oedema (3)				2	1					
Toxaemia (6)	3					2		1		

where proper management and even proper and timely medication was not possible.

In this paper I am not discussing the development of the signs and symptoms of the cases from day to day but a marked feature that I have noticed is that children near about the age of 8 years (6 to 8 and 8 to 12) in the first two groups showed a tendency for a very protracted course; some of them suffering for over two months with various complications during the period of illness and they recovered practically with skin and bone.

On analysing the 30 deaths it is seen that 3 cases died of perforation, 18 died of intestinal haemorrhage, 6 of whom expired within 3 hours from the start of the haemorrhage and the other 12 within 72 hours; 3 cases had acute pulmonary oedema and 6 cases died of toxaemia, that is to say, without any evident immediate cause of death.

Haemorrhage took the greatest toll in my series. Of these 18 cases of death from intestinal haemorrhage 14 died between the 15th to 20th day of their illness and 4 only in the fourth week. Considering the pathological change that occurs in typhoid fever every case runs the risk of haemorrhage so that it is a valuable guide to treatment if it is possible to predict beforehand in some cases at least about the haemorrhage. But is it always possible to prevent the haemorrhage and when haemorrhage has already occurred is it possible to check further haemorrhage and prevent death?

As regards the first question *viz.*, to forestall haemorrhage I think it is possible for some people in some of the cases at least to predict it a few days before the actual haemorrhage. Several years back when I was attending to a case (female, age about 40 years) who was running a remittent type of temperature and occasionally talking incoherent, but otherwise without any symptoms of high toxicity or illness of a serious nature, the patient herself was much upset by her disease and always tried to impress upon her attendants and relations that she was not going to survive that illness and although, I could not find out the actual cause of her anxiety, one Kaviraj predicted that she would have haemorrhage of a serious type very shortly and actually three days later she had intestinal haemorrhage in the morning and expired within a couple of hours. In this particular case every possible precaution was taken to prevent the haemorrhage and haemostatics were kept ready since the day of prediction, and one of her relations, then a medical student was instructed to use them on the first indication of haemorrhage but all attempts to prevent or to check it failed. Since that sad experience I have been trying to find out how could the Kaviraj predict the haemorrhage simply by examination of the pulse. In the particular case, the pulse lost its soft and dicrotic nature before the actual haemorrhage, but became stiffer and of a peculiar vibratory character which I am sorry I am not in a position to describe in detail.

Another peculiarity that I have noticed in cases of intestinal haemorrhage in typhoid fever is that 9 out of 18 deaths from haemorrhage showed comparatively milder signs and symptoms during the course of the disease and apparently the prognosis did not seem to be so bad; rather one would be very optimistic about the prognosis of these cases. Regular examination of the pulse would give in some cases a hint as to the future and possibility of haemorrhage—thus 10 of the 18 cases revealed the above-mentioned change in the pulse—*viz.*, loss of softness and dicrotism at least 2 days before the actual haemorrhage.

Small amounts of blood oozing from the typhoid ulcers as shown by occult blood in stools and bleeding from the gums are rather common findings in typhoid cases. In my series, 33 of the 60 typical cases, 17 of the 20 influenzal type, all the 4 cases with pneumonic onset and 6 of the other 16 atypical cases, *i.e.*, altogether 70 patients, showed more or less bleeding from the gums. Although these are not unfavourable for recovery one must always apprehend danger from a smart intestinal haemorrhage. Once a patient passes fresh blood with his stool and it comes from the small intestine the prognosis is very grave and I have not seen a single case to recover after passing fresh blood with or without tarry stool in a case of typhoid fever. So that I think, once a smart haemorrhage starts in typhoid fever it is almost impossible to prevent further haemorrhage which usually recurs on the 3rd or 4th day, even after every possible precaution has been taken and the patient dies although the

first haemorrhage could have been effectively checked.

As regards perforation every one is aware that it is a serious complication and no medicinal treatment can help the patient but one thing I can mention here that of the 3 deaths from perforation, 2 died as a result of dietetic indiscretion. These two patients, both boys about 7 or 8 years of age, while on the way to recovery in their 4th week after severe toxic symptoms, but not still fever-free, were given by affectionate relations some solid food and the next day they came in for perforation and died within another 48 hours.

About pulmonary oedema one feature was noticed that all the 3 cases had complication of lobar pneumonia during the earlier stage of the disease. Bronchopneumonia is often seen complicating typhoid cases but I think, those cases who get lobar pneumonia during the earlier part of the disease become prone to pulmonary oedema as a result of the myocardial damage done by the pneumonia and although these cases do not die during the course of the pneumonic condition their prognosis becomes more unfavourable than others due to the marked exhaustion and cardiac affection.

Although bronchitis is one of the commonest features of typhoid fever, it does not affect the prognosis in the least. Lobar pneumonia itself is a serious disease and when it complicates typhoid fever the prognosis should be more grave than either of these diseases singly. The only consideration is that in one there should be leucocytosis and in the other leucopenia *i.e.*, an antagonistic relation in the blood picture. But does that favour the prognosis even when pneumonia supervenes in a case still suffering from the toxic features of typhoid fever? Not a single patient under my observation died during the course of pneumonia, although no less than 15 patients suffered from it and only 3 died of acute pulmonary oedema later on.

Of the other complications bed-sore is indicative of a serious prognostic feature. But sores developed in a case of prolonged suffering are not of so much importance as in an apparently well-nourished body. The patients during protracted illness are much emaciated and the bony points get ulcerated especially over the sacral region and the trochanters, very often due to friction with bed clothes particularly when sodden; but those who suddenly develop several black spots and blebs over these regions in one night's time indicate a grave deficiency in vital powers and circulation and the prognosis becomes very grave in these cases.

Various other complications might be mentioned which influence the prognosis of such a prolonged acute illness. Dysuria, which is often noticed in typhoid cases, and albuminuria, with or without casts should not cause great anxiety but involuntary passage of urine, soiling the bed clothes, indicate the depth of stupor and is of a bad omen.

I conclude this paper with a few words about toxaemia, severe toxaemia shown by carphology, subsultus tendinum, low muttering delirium and dry tongue is certainly of a grave omen. Patients with severe toxaemia during the 3rd week of illness often come round whereas others showing low toxic signs may succumb from various other complications. Even highly toxaemic patients with various complications, who do not take per mouth even a single drop of fluid, not to speak of any drug, can be kept alive by rectal feeding and may ultimately recover. So that although severe toxaemia alone, signifies a serious condition, it should not disappoint one more than the other serious complications already mentioned. Of the 100 cases under my observation only 6 died of toxaemia.

In conclusion I quote a few lines from Osler's Modern Medicine (Vol. I p. 154)—"There can be no certainty of the outcome or duration of an attack of typhoid fever and it is never safe to give an absolutely favourable prognosis. The patient with every symptom favourable may become seriously ill or have a severe complication without warning while on the other hand in no disease do we see so many patients recover who have been desperately ill."

—(Read at a Seminar Meeting of the Calcutta Branch, I. M. A. on 14-5-1936).

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EDITORIAL

HELIOTHERAPY IN TUBERCULOSIS

"The sun is a dispeller of ill humours. He is the Healer, the Life-giver. He is the only true Doctor to the troubled mind. He is the best Apothecary in the world. There is no tonic sold for gold, over any chemist's counter, so remedial as that celestial pick-me-up, which is poured for nothing each morning, over that wide counter which is the rim of earth." A layman, Norman Davey, wrote those words and there cannot be a better description of the action of sunlight on human beings. As a healer, as a tonic, sun has been recognised both by laymen and the medical profession from very old times. But it was particularly to Rollier of Lysen and Bernhard of St. Moritz and Sir Henry Gauvain of Alton that this great advance in the scientific application and popularity of heliotherapy in tuberculosis is due. The control and regulation of the treatment were made possible by the advance of our knowledge of Sun's radiation.

Sun's radiation, as it emits, extends far down to the shorter wave length rays. But as it reaches us through the envelope of earth it is modified and extends from 3,000 A. U. to 30000 A. U. An A. U. (Angstrom Unit) is equal to 1/10,000,000 of a millimetre. Broadly this range of rays is divided into three portions. The visible rays, 3,000 A. U. (violet) to 7,600 A. U. (red); the ultra-violet rays extend down to 3,000 A. U.; the infra-red rays extend upto 30,000 A. U.

The questions before us are; which rays are responsible for this healing effect? and how do they act in the human body? It is generally supposed that the action is mainly due to the ultra-violet rays. But have the comforts of heat and joys of vision no part to play? The value of these is obvious on the human mind and therefore on the body especially in such a long ailment like tuberculosis. Regarding the ultra-violet rays, it may conveniently be divided into two groups: (a) Abiotic rays (2,100 to 2,900 A. U.). They are strongly irritant. The shorter of them are absorbed by the horny layer of the skin and has no effect, the longer ones penetrate but slightly and cause irritation and are bactericidal. As is seen from above, sun rays, as they reach us, do not contain these rays. (b) Biotic rays (2,900 to 3,800 A. U.). These penetrate deeper and are less irritant and less bactericidal. If we want the action of abiotic rays, we have to use artificial lamps.

The effects produced in human body by sun's radiations are various. The value of heat and vision are already referred to. Sonne showed that irradiation of the body with luminous rays causes

a rise of temperature (may be upto 115°F.) in the blood of the vascular layer of the skin. He thinks that thermolabile toxins may be destroyed by such temperature and thus produce one of the beneficial effect of light therapy. The ultra-violet rays cause "Sunburn" and pigmentation and it is supposed by some that good pigmenting power is of good prognosis: because it gives better tolerance to the treatment. The same radiations 'activate' ergosterol present in the skin and when this sterol is absorbed in blood produces the effect of antirachitic vitamin. The ultra-violet rays also produce profound changes in the blood, the details of which need not be gone into as the action of such changes is not yet well understood.

The healing and tonic effect of general sun-treatment is considered to be due to an increase of metabolism. Due to raised metabolism there is increased heat production and heat loss from the body. This is provided for by an increase of ingestion, digestion and assimilation of foods. This requires increased oxygenation and elimination of waste products. The body is acting at a higher gear and this helps and hastens the process of repair also. The credit of the production of an increase in metabolism is not due to Heliotherapy alone. Sir Leonard Hill has shown that a body exposed to cool fresh air in the shade shows the same amount of increase of metabolism as it were in the sun. Sun rays by warming the body allows comfortable exposure of naked body to cool fresh air. Thus heliotherapy and 'open-air life' are inseparable and should always be considered together. In short, the following are some of the gains of this combined treatment besides others already mentioned: Minimum infective potential, dust and other injurious particles minimum, heat minimum, optimum condition of O_2 inhalation, better function of the skin, association with light and mental effect of sights and to some extent 'hardening up' of the patients. All these together cause an increase of physiological efficiency and general wellbeing.

If increased metabolism be the cause of healing, it is obvious that there are great limitations to this treatment. Any patient whose body-function can not keep pace with this increased metabolic process will be injured by this treatment. This therapy therefore would be unsuitable for the very old and the very young weak and toxic persons. Beneficial effect of Heliotherapy has been proved beyond doubt in the extrapulmonary forms of tuberculosis by excellent works of Finsen, Rollier, Gauvain and many others. This therapy, in general opinion, is contraindicated in active disease of lungs.

Sunbathing has become a craze in Europe and in winter, to some extent, this is enjoyed in this country also. It is good. But one point must be stressed here. Sun is a powerful therapeutic instrument—powerful for good. It is widely known. What is not generally understood is that it could be very powerful for harm. Many cases of haemoptysis, many cases of flaring up of arrested disease occur in the summer months in Europe due to unrestricted sunbathing. To cut off the dangers of grave risks, this should be regulated by increasing graduated exposures of the parts of the body.

To handle such a powerful agent, the physician must have a thorough knowledge of the local atmospheric conditions and of sun's rays—qualitatively and quantitatively; and also the individual reaction to this treatment. For the former, the excellent work of Prof. P. N. Ghosh, Dr. A. C. Ukil and Mr. M. K. Sen has supplied us with very useful data for Calcutta. They have raised data for the biologically active portion of ultra-violet rays of sun in different seasons and in different times of the day. Their findings show that the intensity of the above rays is strongest in the months of June and July and at midday. Summer months as a whole compared to the winter months have more of those rays. Heat rays increase at midday and in summer months. Morning content of the ultra-violet radiation is less than the midday content. This might lead one to think that, contrary to the popular belief, midday exposure would be more beneficial than morning exposure. That probably is not true. Cool, fresh morning air should excite better reaction, provided the heat is enough to allow comfortable exposure of the naked body. Gauvain thinks that the change from night-darkness to morning-light produces better reaction in the body and therefore morning exposure is more advantageous. It must be understood that neither the ultra-violet content of sun's rays nor any local reaction should act as an absolute gauge in the regulation of general sun-treatment. Individuals vary greatly in their reactions

and the sum total of all the reactions should properly be evaluated and the treatment to be regulated accordingly. Sir Henry Gauvain's theory of "varying stimuli and varying response" is very true and should be the sheet anchor for the management of this treatment. Yet the knowledge of the atmosphere though not essential is very important. It goes a long way in forming our judgments and to prevent a great deal of risks. The authors must be congratulated for such a painful and laborious work. Their new method of "Photographic photometry" which they claim to be more accurate than the chemical and other methods, should be tried by other workers here and abroad. Such work, as the authors recommend, would be of more value if done in places where sanatoria exist or are going to be built, in hill stations and seaside resorts. In this connection it might also be suggested that an investigation into other factors of medical climatology e.g., humidity and rainfall, temperature and its daily variation, duration of solar radiation, dust content and the nature of the wind etc., could also be made. Very little work on this subject has been done in our country. Though climate can not be the main or very important consideration in the treatment of a case of tuberculosis, that it has value in stabilising an arrested case and in speeding up of the cure cannot be denied.

Heliotherapy in non-pulmonary forms of tuberculosis is good and it is going to stay. Properly controlled, well regulated and in conjunction with other methods of treatment it might prove to be of great value in India where there is no dearth of sunshine.

XIII ALL-INDIA MEDICAL CONFERENCE
1936

The XIII All-India Medical Conference will be held at Karachi during the ensuing Christmas week. Subjects concerning the vital interest to the medical profession in India, will be discussed in the Conference. Scientific Section of the Conference and the Exhibition will no doubt afford every medical man a good opportunity to know the advance made in this country in medical science. In order to make this Conference thoroughly representative of the medical profession of India it is requested that all members of the profession should join the Conference and take part in the deliberations.

AMERICAN MEDICINE

NUR M. MALIK, B.Sc., M.D.

"I have gathered a bouquet of other people's flowers; and only the thread that holds them together is my own." —Montaigne.

Scientific American Medicine is surpassed by none. The story of its inception, growth, and maturity, reads like a romance. I want to trace its history from the primitive practices of the early pioneers, to the scientific achievements of to-day. It is fascinating, unique, and instructive, to observe, that a young and vigorous nation, left alone to work out her own destiny, has achieved in a relatively short time much that has taken the rest of the world many, many centuries to accomplish. True, in their earlier period the colonists studied medicine in European clinics, but since then the native ability, zeal, and energy of American scientists have enriched and enhanced our knowledge of disease, by original and far-reaching research. They have given to the world ether anaesthesia; the physiology of the human stomach; the cause and cure of yellow fever; the diagnosis and treatment of appendicitis, undulent fever; and tularemia; the use of tannic acid in the treatment of extensive burns; and, have devised such methods of treatment as Fowler's position and the Murphy drip and button. The Mayo brothers, Crile, Cushing, and Cabot shine with dazzling brilliancy among stellar international figures.

America is a vast and varied land, twice the size of Hindustan. It consists of forty-eight provinces, called States, and the District of Columbia, in which—like Delhi—lies Washington: the national capitol. All are bound together, for mutual benefit the protection, with golden chains of trust and friendship. The States vary in size: a few being as large as all Europe combined, excluding Russia, and others being as small as the smallest Indian Native State. Before the arrival of the European settlers, the great American plains were covered with interminable forests, where roamed the care-free 'Indian'. America is a country of great mountains, great canyons, great waterfalls, great rivers and great lakes. It has a great variety of climate—from the scorching sun of Death Valley in the desert region of the South, to forty and fifty degrees below zero in some sections of the North. America is a melting pot of humanity; a truly great land of peace and plenty where everything is 'bigger and better', and where Freedom and Opportunity walk hand in hand to meet the seeker.

Passing over the details of the discovery of America and of the accounts of early voyages, we find the first colonists settled along the Eastern coast. In obedience to the demands of nature, they developed three distinct modes of livelihood. The New England States in the north with inhospitable climate, and scanty, stony, unyielding soil, forced the inhabitants to turn to the gulf-stream warmed Atlantic sea board for a living. The new-Englanders became a race of fishermen and sea-faring people. The middle section discovered coal and iron deposits, and turned to industry. The south, with its warm climate and large plantations, unwilling to work in its sugar cane, tobacco, and cotton fields, imported African labour, and thus inaugurated two modern anomalies: slavery within a free state, and an aristocracy within a democracy.

In the infancy of the American colonies, medicine, as a profession, did not exist. In fact there was little in Europe itself in the seventeenth century to offer them. What little knowledge there was of medicine was possessed by the monks who guarded it jealously. Surgery was considered as an impure art, below the dignity of a learned profession. Such minor operations as blood-letting and the incision of boils, were relegated to the limbo of 'barber-surgeons'. Any attempt at independent thought was looked upon with disfavor. The healing art travelled in traditional ruts of Galenic principles. To disagree with accepted theory, meant ostracism and often death.

These early European colonists in America practised primitive medicine. They resorted to charms, incantations and prayers to ward off disease

and death. Their troubles began on the trip across the ocean. They brought their own disease with them. It took weeks to travel such a distance in those days. Small over-crowded boats, 'mal de mer', and the lack of proper and sufficient food, lowered their resistance to disease. Scurvy, even though its cure was known at that time, was rampant. Epidemics took terrible toll. Time and again entire settlements were wiped out without leaving a trace. Not many ships were provided with regularly trained medical men to look after the sick, and of those that were, the doctor rarely chose to stay in an undeveloped country to face hardships, privations, and dangers, but returned to Europe. Those who survived the sea voyage were set down in a new land with very little defence against disease and ill-health.

It is at this early period of great need that the American Indian came to their aid. To-day, in the pride of their progress, Americans rarely recall the debt of gratitude they owe to this noble son of the new world. Heartlessly they heap ridicule upon his innocent head. They have forgotten that it was the 'Indian' who gave their forefathers the potato, tobacco, and corn—and who taught them the ways of wild life, and to fish, trap and hunt. Without him the colonist would have surely perished.

The American Indian Medicine Man played an important role in the history of American Medicine. The Shamas were wise men, who knew the properties of remote medicinal herbs. They treated the newcomers, supplied them with these plants, and taught them their virtues. They have given us cinchona, cocaine, cascara, aloes, senega oil and snake root, and a host of diuretics and diaphoretics. The American Indian used the sweat bath extensively: the patient was placed in a hammock in a wigwam, and water was poured on red-hot stones to cause dense clouds of steam. They practised cupping, scarification and venesection, using knives fashioned from flint. Arrow-heads were extracted. Haemorrhages were stopped by pressure and by stuffing the wounds with eagle-down. They knew to insert bark in infected wounds to encourage drainage, and applied balsams to further granulation and stimulate healing. Bone surgery was carried to a high degree of skill. Splints were used for fractures occuring to unfortunate braves. They had devised trephining, symphisiotomy, Caesarian section, artificial limbs, and reduced dislocations, long before a forlorn and derelict crew, in borrowed Spanish ships, blundered upon their shores to plunder and to rape.

Many an 'Indian' chief came to the aid of the sick colonists. Reverberations of their prowess as healers have not yet died down. The average present day American is 'taken off his feet' at hearing the name of 'Indian doctor'. In his ignorance he confuses us with the 'Red man,' and in his enthusiasm he usually launches forth on a real or mythical miraculous cure wrought by some ancient American Indian Medicine Man. Only a few days ago, one of the nurses at my clinic quite buoyantly told the story of how an old Indian squaw had cured the eye of a small boy. It had been swollen, shut for over a week. The ancient woman looked at it and "humph"-ed. Sagaciously, she took the little patient in her spacious lap, scoured his eye with her tongue, and removed a long, curled hair! Of course the child recovered. Stories of this sort are legion.

Up to 1609, there were apparently no physicians for the colonists. In that year Captain John Smith was injured by an explosion of gunpowder, and had to return to England for surgical treatment, "for there was neither a Chirurgeon, nor Chirurgery at the fort." The earliest practitioner of medicine in Massachusetts was Samuel Fuller. He came on the Mayflower in 1620, and was a deacon of the church at Plymouth. Although he did not possess any diploma, nor have official recognition, he is referred to as the surgeon to the settlement. In the absence of trained medical men, it was necessary for governors, clergymen, teachers and other educated laymen to take upon themselves the treatment of the sick and the wounded. Oliver Wendell Holmes, in 1862, read a paper before the Massachusetts Historical Society on a manuscript from the collection of Governor Winthrop, one of the earliest governors of that state. It contains a strange medley of receipes furnished to the governor by a Dr. Edward Stafford, of London, for the benefit of the settlers. There are seventeen prescriptions listed. They throw a flood of light on the then existing European medicine. Witness the following:

8. For the yellow jaundice—Boyle a quart of sweet milke, dissolve therein as much bay-salt or

fine Sal peter, as shall make it brackish in taste; and putting Saffron in fine linen clout, rubbe it into ye milke, untill ye milke be very yellow; and give it ye patient to drinke.

9. For paines in ye brest or Limmes; Wear a Wilde Catts skin on ye place grieved.

11. My black powder against ye plague, smallpox, purple, all sorts of fevers; poyson either by way of prevention, or after Infection. In the Moneth of March take Toades, as many as you will, alive; putt them into a Earthen pott, so it will be halfe full; Cover it with a broad tyle or iron plate; then overwhelme the pott; so ye bottom may be uppermost; putt charcoales round about it, and in the open fayre, not in an house, sett it in fire and lett it burn out and extinguish of itself; when it is cold take out the toades; and in an Iron-Mortar pound them very well and searce them—then in a Cruicible calcine them again; pound and searce them againe. The first time they will be browne powder; the next time black. Of this you may give a dragme in a vehiculum (or drinke). Inwardly in any infection taken; and let them sweat upon it in their beddes; but lett them not cover their heads; especially in the smallpox. For infection, halfe a dragme will suffice; moderate the dose according to the strength of the partie; for I have sett downe ye greatest that is needful. There is no danger in it. Lett them neither eate nor drinke during their sweat, except now and then a spoonful of warme possetdrinke to wash their mouthes. Keep warm and close, (for a childe of 5 years, 10 graynes is enough in infection, for prevention 4 or 5 graynes) till they are perfectly well; and eate but little and that accordinge to rules of physicke.

The same powder is used playster wise with vinegar for gangrene or bite of anie Venomous best, taking it likewise, Inwardly; it is used likewise for all Cankers, Fistulas and old Ulcers and King Evill, strewing it upon the core, and keeping them cleane.

The clergy believed the disease to be the wrath of a just God on a sinful people. One New England minister, Michael Wigglesworth, has left us a poetical resume of the illness prevalent in a specially sickly season. He called it, "God's Controversy with New England, written in the time of great draught Anno 1662, by a lover of New England prosperity".

Our healthful dayes are at an end,
    And sicknesses come on
From year to year, because our hearts
    Away from God are gone
New England, where for many years
    You scarcely heard a cough
And where Physicians had no work
    Now find them work enough.
Now colds and coughs, Rheums and sore throats,
    Do more and more abound
Now Agues sore and fevers strong
    In every place are found.
How many houses have we seen
    Last Autumn and this spring,
Wherein the healthful were too few
    To help the languishing.
One wave another followeth,
    And one disease begins
Before another ceases, because
    We turn not from our sins—
We stop our ear against reproof
    And hearken not to God;
God stops his ear against our prayer,
    And takes not off his rod.

The puritans had much faith in prayers to cure their physical and moral ills. When an epidemic prevailed, days were set aside for fasting and for prayers. The earliest fast day observed in Massachusetts for deliverance from sickness was kept in 1643. They, did not understand the nature of a disease; they bled, they purged, or invoked God to the best of their judgment.

Smallpox was a constant source of trouble. They passed it on to the Indians, who, newly exposed to its virulence, were nearly wiped out. It is commonly known that in 1721, Lady Mary Worley Montague, wife of the British Ambassador in Constantinople, now Stanbul, returned to England and brought with her, the means of blessings bestowed upon the Western world by the Turk, the vaccination against smallpox. English papers carried the news of the new remedy to America. Rev. Cotton Mather became convinced of the usefulness of this method. After being refused by all other physicians of Boston, he prevailed upon his friend, Dr. Zabdiel Boylston, to test the method. The latter had the courage to inoculate, in June, 1721, his own son, another boy, and two servants. It was a complete success but a storm of protest broke out at the idea

of causing an artificial sickness. A bomb was thrown into Mather's home to intimidate and persecute him.

It is said that out of the ten physicians in Boston at this time, 1721, only one possessed a degree. But gradually their number increased. The eighteenth century saw the dawn of a better day. Life became more secure. Homes were built and a new generation grew up. The early ties with the mother country became looser. There was less crossing of the Atlantic in search of knowledge. Home universities replaced the foreign institutions. But medical education was yet to be born. Primitive medicine was replaced by the apprenticeship system; the second phase of the growth of American medicine. As in the days of ancient Greeks, the student attached himself to a master and studied under him. He carried his preceptor's bag, visited the sick with him and compounded and dispensed drugs when required. It was a hereditary calling in some families, such as the Clarks of Boston; guarded jealously, and passed on from father to son. A few took college degree before becoming apprentices, while others continued to cross the ocean to England and the continent to study medicine abroad. The latter returning drew to them many students.

They were men of vision and courage, these pioneers of early American Medicine. Dr. William Shippen, Jr., of Philadelphia, studied in England and Scotland for five years. He returned to his native land in 1762 and, with charts, models and notes, that he brought with him, began to teach Obstetrics. He opened a small private clinic for the poor pregnant women, which he used for instructions. He was joined in that city, three years later, by John Morgan, the founder of the first medical college in America. Dr. Morgan had studied under John Redman for six years and taken the degree of A.B., in a college before going abroad. In England, he studied anatomy under William Hunter, and got his degree from Edinburgh. He travelled on the continent, where he visited such illustrious men as Voltaire, at Geneva, and old Morgagni, at Padua, Italy. He was burning with the desire to see and to learn. During this period of travel, he conceived the idea of founding medical schools in America. He had passed through Paris at the beginning of his continental tour, where, because of his mastery of anatomical technique, he had been given the membership of the Academie of Chirurgie. Upon his return to Paris, he sat down and wrote out his impressions about the medical schools he was to build in his native land. When he showed his notes to the great medical men of Europe, they liked them and encouraged him in his undertakings. Upon his return to Philadelphia, in 1765, with letters of recommendation from his teachers, his task was made easy.

It was the model institution of the period. Many others followed, and with them opened the third phase of the development of American Medicine. These schools were opened as parts of the pre-existing universities. Many students took their degrees from literary colleges before studying medicine. Others, after a practical training of apprenticeship, joined a medical school to round out their training. At that time, the schools required a stay of over three months for a degree. The students brought their own food supplies and lodged in housekeeping apartments, where they took turns in preparing meals and doing chores.

At this time, the war for Independence from England was fought and won. This resulted in a Westward migration. The East had become stale and crowded. The lure of the wide open spaces got into their blood, sending wave after wave of humanity over the great plains. Caravans of covered wagons trailed over the hills and down the dales across the prairies. The 'war-cry' of the period became "Go west, young man, go west". The trail blazers encountered new obstacles in their advance, in adverse nature and the hostile Indians. Their determination triumphed. Families moved into Ohio, cleared the forests, built log cabin houses, planted corn, and when they found newcomers crowding them, moved on to Illinois, or to Kentucky. They say, a pioneer had moved so often, that every Autumn when the harvest was gathered, his chickens used to come and lie down before his cabin door to have their legs tied for moving on to the next place!

More medical men were needed for the enlarging territory, many adventurous spirits joined the new population. These did not fill the need of the ever-increasing population. Cheaper medical schools were started. Wherever there were a few doctors, all they had to do was to get together, announce

the opening of a medical school, and start instructions. It was a profitable business. The students not only paid fees for their schooling, which the teachers pocketed, but also referred more difficult cases to them. There was no system of licensing. Anyone could practise medicine even without a degree.

The more responsible men saw the dangers of the new evil of flooding the land with cheap doctors. A meeting of the medical men of the State of New York convened to take steps to remedy it. The American Medical Association was born in 1847 to watch over the interest of the patient and the doctor. The universities and the states also took up the question. State laws were enacted to issue licenses to practise medicine and State Boards of Medical Examiners were appointed by the legislature.

In America, it takes twelve years to graduate from a high school. The student, who intends to study medicine, is required to spend two, if not more, years as a 'pre-medic', in a recognized literary college. During this period, he studies the basic scientific subjects of chemistry, both inorganic and organic, physics, zoology, botany; one foreign language, either German or French, and Latin. Many medical schools require of students, a degree of A.B., or B.Sc., before admission. In the United States, in a population of 123,000,000 there are about 156, 400 doctors or approximately 1 to 780 people, and twice as many are graduated every year as die. So the medical schools have put up barriers for admitting new students. The annual fees have been raised up to $600 a year, and systems of weeding out the undesirable candidates are in operation. Every year, the schools are flooded with applications for admission. These are carefully scrutinized. The student is asked to send in the names of two or more of his former instructors. These men are consulted as to the fitness of the applicant. Out of thousands, those selected are notified to appear for a personal interview with the Dean and the heads of the department, who question them for their ability and motives for the study of medicine. Only the best, physically, mentally, and morally, as far as is humanly possible to be judged, are admitted. With such a large number to choose from, only the finest of a fine race, finally become physicians.

The curriculum extends over four years. A few more are eliminated. Those who complete the course, are required to serve at least one year of rotating internship in a recognised hospital. Many spend two years and a fortunate few are appointed residents, in their speciality, and stay on for five years or more. All have to pass State Board examinations before they can practise. Many states reciprocate in the matter of licensing, but in some, no matter how long a physician had practised, he must pass their examination before he is allowed to 'hang up his shingle' within their boundary.

The entire American medical profession is organized. The smallest unit is the County society. The membership into one of these requires that a doctor should be a graduate of an accredited medical school, an ethical practitioner and be recommended by one or more members. The payment of dues and the membership in the county medical society, automatically makes a man member of the state medical society, and also of the American Medical Association. To hold any staff position in a hospital, the physician must be a member of his county medical society.

The American Medical Association has its headquarters in Chicago, where it publishes the weekly Journal. It holds annual meetings. This year it was on May 11th—15th, in Kansas City, Missouri. The State Medical Societies also publish their own journals and hold annual meetings. The Michigan State Medical Society met this year in Detroit, in September. The County Societies hold weekly meetings. There are also staff meetings of the hospitals, and clinical pathological conferences, clinics, and post graduate courses of study. Thus a physician who lives in the midst of such an atmosphere of intensive study cannot but keep abreast of medical progress.

A large city like Detroit, with a population of 1,568,662 has about 2,200 doctors. Naturally, there is keen competition in the profession. One must be competent to survive in the struggle. The field of medicine and surgery has become so vast that it is impossible for any one man to master it completely. Many doctors take up one branch of practice and become specialists. This has become the demand of an educated and informed public. In addition to specialization, to save time and expense of the patient, many physicians have organized group or clinic practice. This enables the patient to have the benefit of all modern means of diagnosis

and treatment with little loss of time or inconvenience. Many of these clinics have become internationally known.

America is just emerging from a period of economic stress. The physicians of the land have given freely of their time and knowledge and upheld the traditions of a noble profession. Along with their sacrifices, they have been forced to contend with a number of competitive forces.

As in every other country, America has its cultists, cure-alls and faith-healers. There are chiropractors, chiropodists, osteopaths and Christian scientists—to mention only the organized groups. Human nature being as it is, thousands flock to them for treatment, and return even though deceived. In addition to these, there are free clinics, philanthropic and industrial organizations, rendering free medical care.

Confronted with these problems, American Medicine is again at the cross-roads. The depression, the Cults the Patent Medicine vendors which include, incidentally, our own benign 'Hindu'† healer —and the agencies for dispensing free medicine are making inroads on the legitimate fields of the lawful practitioner. There are constant discussions on the socialization of medicine in the States. Studies have been made of the working of the Panel System in England, of the Health Insurance Plan in Germany, and of the State Control of doctors in Russia. The Federal Government, from the White House in Washington, D.C., has appointed a Committee to report on the cost of medical care. Its findings have not been decisive. The entire situation is still in a state of confusion and discussion.

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Many years ago (1809 A.D.), at little known Motley's Glen, a Kentucky farm, lived a pioneer, Thomas Crawford and his wife, Jane Todd Crawford. Lately she had noticed her body grow larger and larger. She knew the symptoms of pregnancy, because she was the mother of five children. As her time grew nearer, there was no sign of life. Two neighbouring doctors were consulted. They could not give a satisfactory answer but suggested sending for Ephraim McDowell, sixty miles away.

The doctor arrived on horseback, equipped with his medicines and the instruments in his saddle bag. He examined the patient and diagnosed the case as not of pregnancy but of tumor. An abdominal operation, never heard of before, was advised. The seriousness and the dangers of the operation was explained to the patient. She was told that she might not live. The wives of pioneers were no less brave in facing perils than were the pioneers, and she gave her consent readily. McDowell asked her to accompany him to his house in Danville, the then capital of Kentucky. It was in December. The patient rode on a horse; the tumor resting on the pommel. They arrived after several days' journey. The patient was put on the table. A nephew of Mc. Dowell and a young pupil assisted. The abdomen was opened and a large pedunculated cystic tumor of the ovary was seen. The patient gritted her teeth and recited psalms. The tube was ligated, cyst opened and evacuated and removed. The abdomen was closed. The operation lasted twenty-five minutes.

Coming into her room five days later, the doctor found her making her own bed. On the twenty-fifth day she went home. When she died thirty one years later, oophorectomy was not yet generally accepted by the profession, though he had twice successfully repeated the operation.

Once again the curtain is about to rise on the drama of Ephraim McDowell. The spirits of the illustrious dead, Beaumont, Drake, Sims, Oliver Wendell Holmes, and other 'Fathers' of American medicine, look on. A virile and rugged race will emerge triumphant, and restore order from confusion. May we not borrow a leaf from their book?

† (Every Indian—Hindu, Moslem, Sikh, Parsee or a Christian—is a Hindu to the Americans.)

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CASE NOTES

VON JAKSCH'S ANAEMIA

A. C. BOSE, M.B.,
Pathologist, Mayo Hospital, Calcutta.

Anaemia implies a diminution either in the amount of haemoglobin or in the number of red cells in the peripheral blood, and with it other changes in the blood picture may be associated. During the last decade the knowledge of blood diseases and fundamental problems associated with blood formation have advanced greatly. The epoch-making discoveries of the aetiology of pernicious anaemia and of various types of anaemia common among infants and children were indeed the outcome of great advance in haematology after the work of Whipple and his colleagues.

The older classification of primary and secondary anaemia is no longer tenable. The next classification according to the size and colour of red cells (*e.g.* hyperchromic & hypochromic, macrocytic & microcytic anaemias) has been revised and lately put on an aetiological basis, and this is essential for the proper treatment. The aetiology of anaemias in general has been well discussed by Professor L. J. Witts in his Gaulstonian lectures on anaemia published in *Lancet*, 1932. A useful and practical classification of anaemia on aetiological basis has been published by Dr. Napier in the *Indian Medical Gazette* in June, 1936. Dr. Richard Ellis, Pathologist, (of Children's Hospital, Great Ormond Street, London) has given a classification of anaemia of infants with splenomegaly on aetiological basis. This is as follows:—

(1) Excessive destruction of red cells—haemolytic anaemia. Icterus gravis neonatorum: Acholuric family jaundice: Lederer's anaemia (acute haemolytic anaemia).

(2) Deficient formation of red cells and haemoglobin: (a) Destruction of bone marrow by metastatic deposits or by toxins—leukaemia, osteopetrosis (osteosclerotic anaemia) typhoid fever, and aplastic anaemia.* (b) Inadequate supply of materials for the manufacture of haemoglobin — congenital iron deficiency anaemia, nutritional anaemia.

(3) Loss of red cells and haemoglobin by haemorrhage—thrombocytopenic purpura.

Von Jaksch's anaemia like Cooley's anaemia and Banti's disease having an obscure aetiology has been dealt with separately.

Splenic anaemia in infancy was first discovered by Italian writers: Somma in 1884 named it as "anaemia splenica infantile." Di Lorenzo introduced the term "infective" to it supported by other writers who regarded the disease as due to bacterial infection isolated from the spleen. Von Jaksch recorded cases of anaemia with enlarged spleen, high persistent leucocytosis, presence of numerous nucleated red cells, myelocytes, reticulocytes etc., and termed it as "anaemia pseudoleukaemia infantum" which is identical with the splenic anaemia of infancy.

A case of Von Jaksch's anaemia, presumably rare in the tropics which came under the observation of the writer in the Mayo Hospital, is described with complete blood pictures with their microphotographs.

A poor Hindu female child, one year old, was admitted into the hospital with enlarged spleen and fever. The child started this illness about 7 months back; her spleen was gradually enlarging and she became anaemic.

*In Aplastic anaemia the spleen is not usually enlarged.

On examination the patient showed waxy pallor with soft and flabby muscles and definite signs of malnutrition. The abdomen was protuberant, there was slight oedema of the legs; there was no definite sign of rickets or congenital syphilis. The child suffered occasionally from diarrhoea; there were haemic murmurs in the mitral and pulmonary areas and the child developed bronchitis later on. Spleen was enlarged reaching up to the iliac crest downwards and almost upto the midline anteriorly; liver was also enlarged to the extent of 1½ in. below costal margin and was smooth and firm; lymphatic glands (cervical and inguinal) were just palpable. The disease ran an afebrile course except for a short period when she had a slight attack of bronchopneumonia.

The blood picture was as follows:—

Blood Count:—

Total leucocyte count—52,000 per c.mm.
Total erythrocyte count—1,540,000 per c.mm.
Haemoglobin (Sahli's method)—25%.
Colour index—0·8.
Cell volume—36% (Daland's haematocrete).
Volume index—1·2.
Saturation index—0·7.

Differential leucocyte count:—

(1) Polymorphonuclear neutrophils—50%.
(2) Lymphocytes—32%.
(3) Monocytes—6%.
(4) Polymorphonuclear eosinophils 5%.
(5) Myelocytes—
neutrophilic—7%.
eosinophilic, basophilic } —very few.
(6) Mast cells—0·5%.

Halometric index—4·9 (size of red cell 7·4).
Reticulocyte count—27%.
Blood platelets—150,000 per c.mm.
Fragility of red cells—0·3%.
Bleeding time—½ minute.
Coagulation time—1½ minute.
Vandenbergh reaction (direct test) —negative.
(indirect test)—faint reaction.
Formaldehyde reaction—negative.
Malarial parasites—absent.
Mother's blood for W. R.—negative.
,, ,, for Kahn— ,,
Child's blood for W. R.—negative.
,, ,, for Kahn— ,,

There was anisocytosis and poikilocytosis;* normoblasts together with a few megaloblasts and microblasts were found in great abundance numbering about 67% of the total leucocytes; Heteromorphism of the leucocytes was also noted (as shown in fig. 3).

Stool: Several examinations showed the presence of mucus with feculent matter having frothy consistency and greenish colour. No ova, parasites, protozoa nor any cyst were detected. On culture there was growth of lactose fermenter colonies only.

The patient was treated as follows:

Mist ferri et strychnine—thrice daily.
Codliver oil—to rub.

From the 28th July, 1936 Campolan (½cc.) was injected intramuscularly on alternate days; after 4 days the child developed marked oedema of the legs and puffiness of the face and bronchitis; the injection of Campolan ¼c.c. was now given every third day and mist, expectorant was prescribed. The child suddenly became cyanosed on the 15th August, 1936 and expired at 1 p.m.

There was no improvement in the general condition of the child, her spleen was slightly diminished but the blood condition did not appreciably improve. There was reticulocyte response (from 27% to 37%) after two injections of Campolan, but the reticulocyte count came down again in a few days.

I am greatly indebted to Colonel Denhamwhyte, Surgeon Superintendent, Mayo Hospital for encouraging me to publish the case, to Dr. M. N. De, Professor of Pathology, Medical College, for his great help and to Capt. S. C. Dutt, Resident Surgeon, Mayo Hospital, in assisting me with the photographs of the case.

*Turck's irritation cells, polychromatophilia, punctate basophilia were also present.

FIG. 1. Child showing pale appearance with enlarged spleen and liver.

FIG. 2. The same child viewed from side.

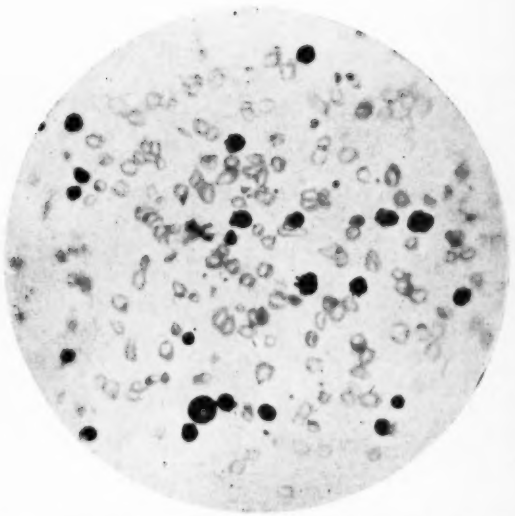

FIG. 3. Photomicrograph from a case of Von Jaksch's anæmia showing normoblasts in numbers and a few leucocytes.

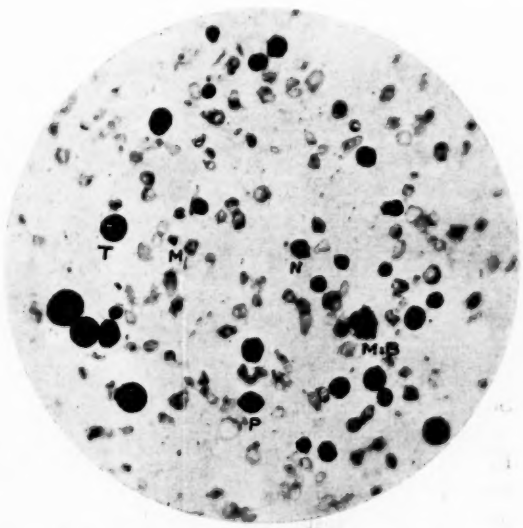

FIG. 4. Photomicrograph from the same case showing microblast (M), normoblast (N), megaloblast (MB) and polymorphonuclear neutrophils (P) of different grades. The nucleated red cells in this figure numbering 19 form about 2/3 of the total nucleated cells.

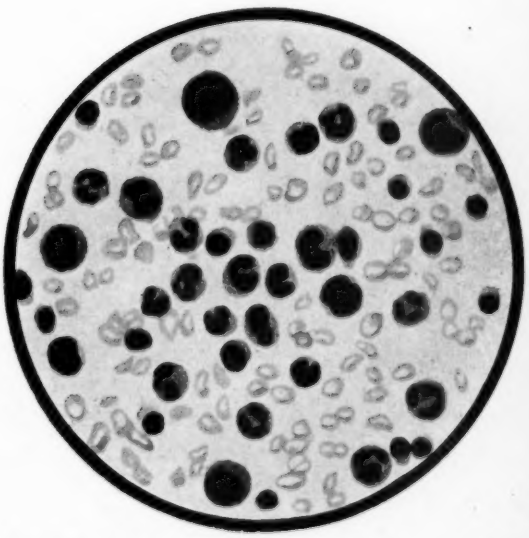

FIG. 5. Blood picture of a case of Von Jaksch's anæmia from the Mayo Hospital showing myelocytes, normoblasts etc. and a megaloblast showing mitosis.

ENDOTHELIOMA PLEURA

R. L. SONI, M.B., B.S., F.R.H.S.,
Paungde (Burma).

Pleural endothelioma is a very rare malignant condition. Very few cases are on record. Lewis[1] in a meeting of the Section of Pathology of the Royal Academy of Medicine in Ireland in January 1932, showed and described a specimen of the condition from a woman aged 41. No other case appears to have been recorded within the last 6 or 7 years. The extreme rarity of the affection prompts me to record the following case that came under my observation in July 1934:

CASE REPORT

On the 26th July 1934, I was called to a distant Buddhist Monastery located in the heart of a jungle, to see the high priest (phongyi) of the institution. The phongyi, a Burman, 50 years of age, apparently well nourished, was found sitting in bed, propped up with pillows, breathing heavily and wearing an expression indicative of pain and despair. He complained of (1) Anorexia, duration 7 months, (2) Dyspepsia, 6 months, (3) Hacking cough, 6 months. (4) Swelling and pain in left side of chest associated with breathlesness, 5 months, (5) Swelling and pain in liver region, over 4 months, and (6) Quick emaciation, 2 months.

History:—His troubles dated back to 7 months, before which he had not suffered from anything serious enough to be recorded. He gave no history of dysentery, diarrhoea, malaria or venereal disease. His habits were like other Buddhist priests—more or less regular in routine, taking food once a day and that before midday, mixed diet, spending time either resting and reading or going about preaching.

Seven months back he noticed that he was losing his appetite and within a month in addition to a slight dry cough he developed some indigestion. In another month generalised swelling of the left side of chest associated with dyspnoea followed. A fortnight later the liver became enlarged and somewhat painful. The hepatic enlargement ceased to increase further within a month but the left side of chest continued to bulge and became more tense till he could not even lie down without troublesome dyspnoea. Moreover the pains in the chest coming on, more or less, in paroxysms and radiating sometimes to the abdomen and sometimes down the left arm, added to his distress. An exploratory puncture two months prior to my visit was stated to have revealed blood-tinged serous fluid. During the 7 weeks that followed the initial tapping he was aspirated 9 times by various physicians and each time one to two quart bottles of brown fluid were removed, each successive interval between the aspirations getting less. There was no history of fever throughout the illness. The last aspiration was done 5 days before my visit. He had also received a course of emetine without benefit, a couple of months earlier.

Examination of the patient:—Temperature 98°F. pulse 90 per minute, regular but of small volume. Respirations 24 per minute, laboured. Heart was displaced to the right and displayed local murmurs at the base. No obvious abnormality was detected in the right lung except that breathing was deep. Left side of chest was uniformly enlarged and the intercostal spaces were bulging. Palpation elicited tenderness and sense of fullness. Vocal fremitus was markedly diminished. Percussion revealed dullness and stethoscope found that side of chest silent. Examination of the abdomen revealed a hard liver displaced two fingers downwards, slightly palpable spleen and sigmoid and coecal regions neither tender nor thickened. Three glands, one of the size of a walnut, and two of almonds, were palpable in left axilla. There were no palpable glands in cervical regions. Hands and feet were free from oedema. Urine was high coloured, less in quantity, 1020 in specific gravity, but free from albumen or sugar.

An aspiration was performed and 30 oz of brownish fiuid slowly removed. This relieved the patient to a considerable extent. At the end of the operation physical examination showed heart still displaced, breath sounds feeble, but V. F. and V. R. marked in patches.

Examination of the fluid:—Colour brown: Specific gravity 1025: Reaction to litmus?: endothe-

lial cells singly or in groups abounding under the microscope.

Diagnosis:—Diagnosis of haemorrhagic effusion was evident. Rapid re-accumulation of haemorrhagic effusion in an elderly person, the interval diminishing with each successive tapping, the presence of axillary glands, afebrile though rapid course, associated anorexia and above all the cytology of the fluid, led one to the diagnosis—endothelioma pleura. The possibility of liver abscess bursting in to pleura was an important consideration, but the facts of the case were strong enough to rule it out.

Subsequent Course:—The patient being of conservative type resented even an x-ray examination and yet wanted immediate cure. Edwards[2,3] offers a reasonable hope of radical cure only in localised endothelioma of pleura, before the occurence of secondary deposits. In cases with diffuse extension and secondary deposits neither x-rays nor radium, radon seeds or operative interference, have yet promised any decisive results. The case in hand was evidently one with extensive involvement and so I failing to give any hopeful prognosis, he passed back in to the hands of indigenous medicine and died three weeks later.

Postmortem:—No regular postmortem was performed but some of the educated people who happened to be present at the time of evisceration—a sort of ceremony to which the dead body of a Phongyi in Burma is submitted for effective preservation for the right royal funeral accorded, at an auspicious date some months later—testifiied to the findings that the pleura on the left side was bathed with brown fluid similar to that got at aspiration and was rough nodular and adherent at places: also that the left lung was a shrivelled mass removed with less ease than the right lung. No other information could be got about mediastinal and abdominal abnormalities. It is extremely regrettable that a very valuable pathological museum specimen was lost due to delay in receiving the news.

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CURRENT MEDICAL LITERATURE

MEDICINE

Abdominal Manifestations of Arterial Disease

LAKIN (*Practitioner*: June, 1936: Page 693) observes that acute coronary occlusion with cardiac infarction when giving rise to abdominal pain may be confused with such acute abdominal conditions as perforated peptic ulcer, biliary colic or acute pancreatitis. Pain and vomiting may be present in both but a past history of precordial pain on exertion, with complete and thorough physical examination bringing forth such findings as dyspnoea, signs of enlargement of heart with muffling of the first sound, pericardial murmur, a lowered blood pressure, an electrocardiogram showing inverted T waves, a Pardee's curve or intraventricular or auriculoventricular block, fever, leucocytosis and such negative finding as complete absence of abdominal rigidity will clinch the diagnosis of coronary occlusion. The author further notes that angina pectoris and cholecystitis often coexist and surgical treatment of the diseased gallbladder very often ameliorates anginal attacks. Cholelithiasis may simulate abdominal angina when presence of dyspnoea and absence of rigidity of the right rectus will settle the diagnosis. A careful examination of the heart and a cholecystogram will be of great service.

Undernutrition in Treatment of Coronary Artery Disease (Thrombosis): Effect on the Basal Metabolism and Circulation

MASTER, JAFFE AND DACK (*Journ. of Clinic. Investigation*: July, 1936: page 353) in reporting on their studies of the effect of low calorie diet (800 calories) on basal metabolism in 28 coronary thrombosis and 14 angina pectoris patients whose control basal metabolism was within normal limits observe that the basal metabolic rate is lowered to the extent of 15 to 35% in 31 patients (71%), to 14% in 6 and below 10% in 5 and the time taken for the basal metabolism to drop was 2 to 4 weeks and a similar time was taken for its return to normal following resumption of a regular diet. With this drop in the basal metabolism there are no such evidences of hypothyroidism as myxoedema, diminished blood velocity and hypercholesterolaemia. Insufficient loss of weight, cardiac failure, upper respiratory infection and repeated attacks of angina pectoris are the few factors which tended to prevent a significant fall in the basal metabolism. The authors further observe that the lowered basal metabolism produced a beneficial effect on the cardiovascular system in the shape of slowing the pulse rate, decrease in the blood pressure and pulse pressure, diminution of the cardiac output and work of the heart.

Epidemic Encephalitis

SLESINGER (*Journ. Amer. Med. Sci.*, August, 1936, page 223) gives a report on the study of 160 cases of epidemic encephalitis seen between July 14 and September 15, 1935. The author observes that the maximum incidence was between July 25 and August 7, the proportions of males to females affected was 3 to 2, there was only 17 patients over 30 and 6 under 2. The disease is a virus infection, and is highly contagious being transmitted by droplet infection. He then describes the clinical features of the disease with blood findings and spinal fiuid findings which are not very characteristic. One case only died and the post-mortem findings were "those of an acute haemorrhagic meningo-encephalitis" showing numerous petechial haemorrhages throughout the brain and a large area of haemorrhage in the posterior end of the thalamus which had burst into the lateral ventricle. Among 159 that recovered there were seldom any complications or sequelae. Convalescent serum was used both as a prophylactic as well as a curative agent and found to be of definite value.

Nephritis in Gout

SCHINTTER AND RICHTER (*Amer. Journ. Med. Sci.*, August, 1936, page 241) in reporting on the study of 56 cases of true gout observe that 17 (31%) had clinical nephritis with definite deficient renal function and that the nephritis was of vascular type in 15 and glomerular in 2, that 5 died of uraemia and of the 4 cases autopsied 3 had predominantly vascular nephritis and 1 glomerular and that of the remaining 38 cases without nephritis 16 had albuminuria. 4 out of 16 cases had albuminuria of cardiac origin and the rest did not show much impairment of renal function for a diagnosis of nephritis. They note that vascular disease and hypertension are more common in gouty patients than in non-gouty ones of the same age the incidence of hypertension in 55 cases being 54% and of vascular disease 67% and that heredity, alcoholism, and obesity play no part in the vascular disease or hypertension.

The Circulation in Lobar Pneumonia with Special Reference to Pulmonary Oedema

HITZIG, KING, BULLOWA AND FISHBERG (*Journ. of Clinical Investigation*. July, 1936, page 452) at the Annual Meeting of the American Society for Clinical Investigation held in Atlantic City on May 4, 1936, made observations on the circulation in lobar pneumonia with special reference to pulmonary oedema:

"75 patients were studied at the height of lobar pneumonia. Arm-to-tongue circulation time (saccharin) was normal in 67, prolonged in 8. Of these 8, 4 had pre-existent heart disease. Arm-to-lung time (ether) paralleled arm-to-tongue time. Normal circulation time was observed within 30 minutes of death. Venous pressure was normal in 66, elevated in 9. Of those elevated venous pressure, 3 had pre-existent heart disease, in 2 it was secondary to alterations in respiratory mechanism due to pulmonary oedema and 1 had singultus. Circulating blood volume (congo red, 65 cases) was normal. Eight patients were studied at the height of the pulmonary oedema (7 fatalities). All had normal

circulation time. Six had normal venous pressure, 2 slight elevation.

Conclusions—Heart failure sufficient to retard blood flow is very rare in pneumonia without pre-existing cardiac disease. This supports the view that routine digitalisation is inadvisable. The normal circulation time indicates that pulmonary oedema in pneumonia is not due to heart failure. Previous investigators have found evidence of pulmonary hypertension and generalized increase in capillary permeability in pneumonia. It is suggested that these factors participate in the pathogenesis of pulmonary oedema in pneumonia."

Ganglionectomy in the Treatment of Severe Polyarthritis and Osteoarthritis

YOUNG (*B. M. J.*, August 22, 1936, page 375) gives in detail the report of some cases of profoundly disabling polyarthritis specially in those of a rheumatoid type and even in cases of osteoarthritis recovering marvellously by ganglionectomy. The author observes that the pain is relieved very quickly after the operation and the limbs become quite useful and though the procedure is effective in chronic cases the author suggests its being tried as a therapeutic agent even in earlier and more active stage of the disease.

Foreign Protein Therapy in the Treatment of Undulant Fever

ERVIN, HUNT AND NILES (*Journ. Amer. Medi. Sci.*, August, 1936: page 284) observe that of the 12 cases of undulant fever observed 10 were treated with intravenous use of typhoid vaccine with 100% cure. They further note that there have been no recurrences and the follow up agglutination tests for *Br. abortus* were negative in 9 out of the 10 cases so treated. The results obtained can compare favourably with the treatment by the specific vaccine from *Br. abortus*.

Saline Treatment in Bromide Rash

LI (*Chinese Med. Journ.*, May, 1936: page 665) recommends the use of normal saline in the treatment of bromide rash. He advises its use either intravenously or by mouth or by combined routes. When given intravenously it should be used in 400 c.c. doses, 2 such doses to be given at a week's interval or a third dose of 200 c.c. may be necessary ten days later. Oral administration should be by 60 grs. of sodium chloride with salol per day. The author observes that the skin lesions improve and bromide begins to be excreted soon after the first injection.

SURGERY

Emergency Operation in Acute Osteomyelitis

MCKEEVER AND WILSON (*Journ. Bone and Joint Surg.*, April, 1936, page 328) in reporting their observations on 110 cases of acute osteomyelitis in children write that the immediate operation may not be a life-saving measure. 98 were cases with diffuse bone infection and required operation at some stage of the illness and majority of them were acutely ill though some were subacute with localisation of the infection in the shape of subcutaneous abscess or spontaneous sinuses. Of these, 24 cases had early drainage of the medullary canal (within 7 days of onset of illness) with death in 6 cases and with metastatic complications in 9. In another group of 31 cases of similar nature the operation was delayed for a period varying from 7 to 28 days with only 3 deaths and 7 metastatic complications. Not only the mortality was lower in the cases with delayed operation but also the incidence of metastatic complications and the authors ascribe this lowered mortality to the power of the body to localise the disease and to the effect of general treatment in improving the resistance of the child *viz.*, the splinting of the limb and combating of the shock and dehydration.

The Recoil following free Drainage in Acute Intestinal Obstruction and other Analogous Conditions

WHEELER (*Lancet*, August 15, 1936, page 361) lays particular stress on the general principle that "when an organ or a system is suffering directly from pressure effects or indirectly from back pressure the greater the pressure the more gradual should be its relief" and writes that in intestinal obstruction the greater the distension and the longer the history the more slowly should the intestinal contents be evacuated through a small calibred enterostomy tube because this gradual relief allows a readjustment in

circulation and absorption in such a way as to avoid the deleterious effects which usually follow sudden changes. "The general circulation would not be flooded by depressor blood from the recovering bowels." The author further notes that in sudden release of distension the drainage is complete, the walls of the gut collapse and get approximated, thus impeding the further flow of retained material from the distended coils above where as in cases with gradual relief of distension the intestinal contents pass down from above by a process of siphonage until the drainage is complete. The author mentions also the other methods of treatment usually followed before, during and after operation including the replacement of lost fluids and chlorides, blood transfusion and lavage and drainage through duodenal tube.

Some Observations on the Pathology of Appendicitis

TRINCA (*Australian and Newzealand Journ. of Surg.*, 1936, 5, page 258) observes that the studies of the position of the appendix both in cadavers and in the living reveal that the position of the appendix varies with the location and the degree of distension of the caecum and torsion, kink and twist of the appendix is produced by much caecal distension. Since the appendicular artery does not anastomose freely with the caecal branches and is in reality an end-artery and since it lies behind the distal part of the ileum, caecal distension will cause pressure on the artery producing ischaemia which in its turn will cause tissue stagnation and the so-called catarrh. This will in certain cases lower the resistance and secondary invasion by the intestinal flora takes place and the typical picture of appendicitis follows. A longer period of anaemia produces gangrene. The author thus maintains that the primary causative factor in appendicitis is not the bacterial invasion and mentions the modern habits of eating and diet as predisposing factor. Purgatives do more harm by causing increased peristalsis and caecal distension favouring torsion, kinking and vascular disturbances of the appendix.

Experimental Studies of Bacterial Cholecystitis

ARONSOHN (*Amer. Journ. Surg.*, 1936, 31, 18) writes that the experimental studies reported in his article were carried out over a period of thirty-six days with streptococci, staphylococci, the colon bacillus, and the bacillus welchii. As a rule the bacteria were introduced into the gall-bladder under ether anesthesia through a catheter inserted through the common duct, but in a few instances bacterial suspensions were injected through the gall-bladder wall. The results showed that in a non-traumatized gall-bladder it is difficult to produce cholecystitis by the introduction of virulent bacteria, but in the presence of stasis of the bile (produced by ligation of the cystic or common duct) or of trauma to the gall-bladder wall, severe infection occurs with considerable constancy. (*Surgery, Gynec. & Obst.*, August, 1936, page 132).

PATHOLOGY AND BACTERIOLOGY

Modified Bendien-Lowe Serum Test for Malignancy

JONES AND WOODHOUSE (*Quarterly Journ. of Med.*, April. 1936, page 141) write that Bendien demonstrated that when acetic vanadate solutions of suitable pH and concentration were added to blood serum, a precipitate of protein vanadate was obtained which is specially the case with sera obtained from cancer patients (as claimed by Bendien). But it was found, however, that many conditions other than malignancy gave enhanced flocculation. The modification introduced by Lowe were designed to remove these difficulties and at the same time to give quantitative basis to the test, the readings being taken by means of the Zeiss interferometer. The writers have however used nephelometric methods of observation. Over 450 sera from patients approximately half of which were suffering from some type of malignant neoplasm and half from non-malignant pathological conditions, together with a few normal sera, have been examined by the modified method. Seventy five per cent. of correct diagnosis have been obtained for both classes. The results have been examined with regard to the type of precipitation, the age and sex of the patients and notes of typical cases are included in which the test was found to agree with findings at post-mortem examination or operation inspite of various clinical evidences to the contrary. The value of the test in prognosis has also been laid down.

The Effect of Amidopyrine upon the Red, White and Polymorphonuclear Blood Cells of a Series of 100 Patients

RAWLS (*Journ. Amer. Med. Sci.*, August, 1936, page 175) observes that amidopyrine when administered in sufficient doses to 400 patients for a prolonged period produced only 4 cases of agranulocytosis. He further observes that 100 of them who were studied haematologically did not show any appreciable change in white blood cells or polymorphonuclear counts except in those cases which developed agranulocytosis and that there was a significant increase of red blood cells. Each patient received a mean daily dose of 13·08 grs. and a mean total amount of 1098 grs. of amidopyrine during a mean interval of 84·36 days. The author maintains that agranulocytosis developing during the course of amidopyrine medication is due to an individual hypersensitiveness or idiosyncrasy.

A Glimpse into the Study of the Epidemic Dropsy in Bengal

BASU AND CHAUDHURI (*Carmichael Medical College Magazine*, Vol. IV, No. 1, page 27) studied the stools of persons suffering from epidemic dropsy by a special method of plating and observed that non-lactose fermenters were found to be in preponderance in almost every case and they were mostly organisms of the salmonella and paracolon groups. They further observed that rats fed with cultures of some of the selected organisms of these groups died within 24 hours exhibiting on histological sections of the heart, lungs, liver, kidney and intestines great capillary congestion similar to that found in cases of epidemic dropsy. Vaccines prepared from one of these strains were injected into a large number of patients and the results obtained were very hopeful. The administrations of the vaccine stopped the oedema, lowered the intraocular tension and relieved the intestinal symptoms within a very short period without subjecting the patients to various forms of dietetic and drug treatment. A bi-weekly injection of six doses and in certain rare cases 12 doses starting with an initial dose of 10 millions of organism per c.c. was necessary. Very early cases responded so nicely that only two injections produced a well marked effect. The authors, however, leave the question of mode of action of the vaccine in these cases an open one.

Hormonal Regulation of the Number of Blood Platelets in the Blood

ZONDEK (*B. M. J.*, August 22, 1936, page 387) observes that the injection of the hormone of the thyroid gland produces an increase in the blood platelet count, the increase starting after 24 hours and lasting till 72 hours when it stops. The injection of superarenal cortex was found to decrease the number of platelets in a number of cases. The author further observes that this hormonal action is more constant on platelets than on red blood cells.

TROPICAL DISEASES

Three Clinical signs useful in the Diagnosis of Chronic Amoebic Colitis

CASTELLANI (*Jour. Trop. Med. and Hyg.*, 1935, Nov. 1, Vol. 38, No. 21, pages 267—268) writes that "the classical symptoms of chronic amoebic colitis-diarrhoea with blood and mucus are often absent, and the entamoeba may be looked for day after day in vain. The author mentions a case where no amoebae or cysts or Charcot Leyden crystals were seen in 89 consecutive daily examinations, but positive results were obtained on the 90th day. He mentions three clinical physical signs due to affection of the liver in latent or very mild amoebic colitis, though hepatitis, fever and leucocytosis are absent. The first two signs are elicited with the patient recumbent. (1) percussion from the umbilicus to the ensiform cartilage results in production of pain when the percussion reaches immediately below the ensiform cartilage. Pressure will clicit the same sign. The pain of duodenal ulcer or hyperchlorhydria is usually lower along this line, while that due to cholecystitis is to the right of it. (2) The midaxillary line is marked with a pencil; from a point 4 cm. below the nipple a line is drawn horizontally to meet the former line at a right angle. The sign is dullness to firm percussion at the spot where these two lines meet and for a short distance outside it. (3) With the patient sitting up in bed a band of dullness is present at the right base and tactile fremitus there may be increased. This is ascribed to an enlarged liver thrusting up the diaphragm and giving the signs of partial consolidation of the lung adjacent.

The author states that in his experience the first sign is present in some 15 per cent. of such cases of amoebic colitis with little or no other indication; the second in 20 per cent. and the third in 10 per cent. The combination of two is very suggestive and three almost diagnostic. (Trop. Diseases Bulletin: July, 1936: Vol. 33: No. 7: pp. 541).

Results and Dangers in the Treatment of Amoebiasis—A Summary of Fifteen years' Clinical Experience at the Mayo Clinic

BROWN (*Journ. Amer. Med. Asson.*, October 26, 1935, page 1319—25) deals with the subject in 3 sections. In the first are mentioned the commonly used drugs *viz.*, emetine, treparsol, stovarsol, arsphenamine, yatren, ipecacuanha, bismuth emetine iodide, vioform, carbarsone "but except with the first three the number of patients treated were too small for valid inference." 554 patients had emetine and 8 of them showed the toxic symptoms in marked degree and another 8 in mild form and these toxic symptoms were peripheral neuritis, palsy, cardiovascular disturbances, rapid pulse, asthenia, vomiting and diarrhoea. Stovarsol was given to 232 cases with no death, toxic erythema in 13 cases and peripheral neuritis in one. Treparsol was used in 307 patients 8 of whom only showed toxic erythema. Yatren was used in 37 cases and vioform in 18 only. The second section deals with the results of treatment which go to show that emetine is best to control the acute symptoms but combined treatment is necessary for a complete cure. The third section deals with present methods of treatment, *viz*, a course of emetine followed by treparsol one to three courses at 10 day's interval if there is no intolerance and if the stools prove still positive a few courses of yatren with a week's interval and if still unsuccessful a course of arsphenamine given intravenously every week for 6 weeks and 1 drachm of bismuth subnitrate 3 to 6 times daily during that period.

A Case of Human Infection with Dientamoeba Fragitis Jepps and Dobell in Calcutta

DAS GUPTA (*I. M. G.* Sept., 1936: page 528) describes a case of infection with dientamoeba fragilis in a young Bengali, resident of Calcutta who has never been out of India, giving the history of occasional attacks of diarrhoea alternating with constipation for 2 months. Two of the five specimens of stool available showed dientamoeba which was peculiar in its size being observed to be upto 16·5 μ in diameter in contrast to what Dobell noted as 3·5 to 1·2

PEDIATRICS

Infantile Eczema

PANJA (*I. M. G.*, Sept., 1936, page 506) in reporting his observations on the study of 250 cases of infantile eczema (of which 30 were studied in detail for working out the aetiology) writes that the age incidence of the disease varies from 3rd month to 5th year, males and females are equally affected by it, all races and babies of rich or poor parents are equally susceptible, the disease is not contagious and it occurs throughout the year with maximum incidence in the winter months. 17 out of 21 cases gave distinct positive reactions to cutaneous milk test, and there is a leucocytosis in every case with eosinophilia 10 to 60% (average being 15%) and 25 samples of stool examined showed Giardia cysts in 3, Charcot-Leyden crystals in 7, streptococcus haemolyticus in 6, enterococcus in 8 in addition to pus cells, hookworm and ascaris ova, and many other bacteria of pathological significance though only one sample of stool from each case was examined. Scrapings from the lesions and the scalp of 23 cases did not show microscopically any Malassez spores though culture of them showed spores only in 3 cases. Over-feeding or under-feeding of the baby, the improper diet of the mother, external irritation of the skin by clothes, changes of temperature, diet, sweat etc. are not the main causes of the disease though some of his cases became worse on forced feeding with cow's milk and improved considerably when the milk was withdrawn from their diet and when these patients were put on mixed diet of vegetables, fruit juices and eggs. Those are the exciting factors and the author maintains that "the child's skin gets sensitized to an antigen which may be endogenous in the bowel or exogenous in the food or both". The frequent absence of correlation between the lesion and the external factors and presence of milk sensitiveness, abnormal blood and bowel conditions all these prove his contention. He then describes the clinical features of the disease, its differential diagnosis and prognosis. He next deals with the treatment under

4 heads *viz.*, (1) general measures, (2) diet, (3) external treatment, and (4) internal treatment. Under the first heading he advises to avoid exposure to high winds and bright sun, medicated soaps, vigorous rubbing, uncleaniness, tight and heavy clothing and constipation. Change of climate, he remarks, is often successful when diet and medicines fail. Regarding diet he prefers a mixed diet of vegetables, fruit juices and eggs in older children with restriction of sugar, fat and cow's milk, and stoppage of any particular food to which the child is intolerant and for breast fed children he advises that mother's diet must not contain hot curries, excessive meat, fish and eggs. For medicinal treatment he advises (1) early morning application of warm olive oil with camphor for 2 to 4 hours to soften the scales to be followed by (2) warm bath or sponging with a weak lysol solution (15 drops to 1 pint of warm water) and (3) calamine lotion or paste according as the lesion is moist or dry respectively and (4) for internal use hydrarg cum creta, glucose, calcium with parathyroid, thyroid and sulphur. He recommends injection of soamine in cases where there is eosinophilia, whole blood and autohaemotherapy in obstinate cases and milk injection specially in those sensitive to milk.

Adrenal Cortex and Vitamin C in Diphtheria

BERNHERDT (*Deutsche Medizinische Wochenschrift*, July 10, 1936, page 1123) reports on very successful results in circulatory failure including that of peripheral circulation in cases of diphtheria by combined treatment with suprarenal cortex 5 to 10 c.c., vitamin C (Cebion) 2 c.c. and 20 to 40 c.c. of 10% glucose with 10 c.c. of 10% sodium chloride all intravenously. The injections should be repeated every second or third day. The author holds that he had not lost a single case of severe diphtheria since he started this combined treatment.

The Treatment of Severe Diabetes in Children with Protamine Insulinate

BENNET AND GILL (*Lancet*, August 22, 1936, page 416) in reporting on 4 cases of severe diabetes in children treated successfully with protamine insulinate observes that though 2 of them had been on 3 doses of insulin daily and all used to get hypoglycaemic attacks in the morning and persistent morning glycosuria inspite of sufficient doses of insulin the administration of protamine insulinate in them soon made the urine sugar free, abolished all severe reactions, decreased the total daily dose and increased greatly the general well-being of the patients. The injections were painless and though there was at the beginning a tendency to mild reactions appearing during the later hours of the night this was abolished by a slight change in the distribution of carbohydrate.

Autogenous Vaccine Therapy in Pediatrics

BLOOM (*New Orleans Med. and Surg. Journ.*, June, 1936, page 738) reports on the use of autogenous vaccine in 46 cases of common cold, 35 cases of asthma, 33 of pyelitis and 11 of furunculosis with good results in 28·4% of cold cases, 25·7% cures and 40% noticeable improvement in asthma cases, 45·5 cures with resistant pyelitis cases and 100% cure in furunculosis cases.

PHYSIOLOGY, BIOCHEMISTRY AND NUTRITION

Brewer's Yeast and Blood Production

MANVILLE AND GONDAHL (*Amer. Journ. Physiol.*, August, 1936, page 626) thus summarise the results of their experiments:

(1) White rats raised on a diet devoid of B complex vitamin and subjected to rarefied atmospheres are not able to compensate by increased production of red blood cell and haemoglobin.

(2) Animals receiving the same diet but supplemented by addition of brewer's yeast are enabled to produce an increased amount of haemoglobin and red blood cell the former more than the latter and in quantities proportional to the amount of yeast ingested. In the increase of red blood cell there was relatively more increase of the reticulocytes.

(3) The red blood cells of animals exposed to decreased atmospheric pressure are capable of withstanding a hypotonic saline of as low a concentration as 0·38% and thus represent decreased fragility due perhaps to cutting off of the splenic circulation.

(4) Some factor in yeast appears to be necessary to carry megaloblast to normoblastic stage and B_1 and B_4 are believed to be the responsible factor.

The Influence of Pylorus on the Secretion of Acid by the Fundus

WILHELMY, O'BRIEN AND HILL (*Amer. Journ. of Physiol.*, August 1, 1936, page 685) study the effect of the pylorus on the acid secreting mechanism of the fundus by using new methods. A comparison of the acid secretion in two dogs before and after partial gastrectomy with that in two dogs before and after gastroduodenostomy showed that after removal of the pylorus the acid secretion was lowered more than could be accounted for by the diluting and neutralising effects of the duodenal secretions entering the stomach. A study of four whole stomach pouches with the pylorus intact and five with pylorus removed showed that the acid secretion was markedly lowered by removal of the pylorus.

The Renal Elimination of Phenol Red in the Dog

SHEEHAN (*Journ. of Physiol.*, August 19, 1936, page 237) after measuring extraction of phenol red form the plasma during excretion of the dye by the kidney at intervals of time upto 3 hours after injection of the dye concludes that extraction ratio is about 50 to 60 per cent. at low plasma concentrations and about 10 per cent. at high plasma concentrations. The clearances of the dye also show an inverse relationship to plasma concentrations. These facts are in accordance with the view that about 20% of the plasma is filtered at the glomeruli and that in addition there is secretion of a relatively constant amount of the dye by the tubular epithelium (other explanations being however possible).

The Influence of Copper on the Rate of Disintegration of Mammalian Erythrocytes

WICKWIRE, BURGE AND KROUSE (*Amer. Journ. of Physiol.*, August 1, 1936, page 639) write that the rate of disintegration of red blood cells of nutritionally anaemic rats was found to be greater than that of normal animals and the red blood cells of animals given an adequate copper diet showed increased resistance to disintegration and these experiments would seem to indicate a beneficial effect of copper to changes in the corpuscles.

Sympathetic Vaso-Dilation in the Skin and the Intestine of the Dog

BULBRING AND BURN (*Journ. of Physiol.*, August 19, 1936, page 254) conclude as follows:

(1) In contrast to those in muscles the vessels in the skin of dog's hind limbs receive no dilator sympathetic supply. But the skin vessels of the dog's ear have got vaso-dilator sympathetic innervation.

(2) The vessels of the intestine receive a dilator supply in splanchnic nerves. Ergotoxin stimulation of splanchnics in anaesthetised animals always caused vaso-dilatation and dilatation may also be obtained sometimes during intravenous infusion of small dose of adrenalin.

(3) These dilator effects are unaffected by eserine or atropine.

(4) The results also show that the sympathetic dilator fibres which act by liberating acetyl choline are not present in skin and intestines of the dog and are confined to the skeletal muscles.

The Mechanism of Rhythmic Changes in the Calibre of the Bronchi during Respiration

ELLIS (*Journ. of Physiol.*, 19th August, 1936, page 298) summarises the results of his experiments thus:—The rhythm of bronchial muscle movements under all conditions of experiments in the dog is identical with that of the respiratory movements of the chest-wall. It is changed by section of vagi, phrenic nerves, and of cervical spinal cord in so far the respiratory movements of the chest-wall are thereby affected. By rendering the lungs motionless the rhythem is abolished and therefore it is concluded that all rhythmic changes in the calibre of bronchial muscles are produced by the respiratory movements of the thorax. The chief function of the bronchial muscles seem to be maintenance of tone which can be altered by the vagus and the sympathetic.

MEDICAL RELIEF IN MADRAS VILLAGES

A Madras Press 'Communique' states:—

In 1924, the Government inaugurated the rural medical relief scheme as the cheapest and most satisfactory method of bringing qualified medical men to settle permanently for practice in specified remote villages where qualified medical relief is badly needed, by the offer of a suitable subsidy which will help to maintain the practitioners during the first few years until they earn the confidence of the rural people and are able to build up a practice for themselves. Besides economy, the scheme had also other advantages, *viz.*, the relief of unemployment among medical men and development of the private medical profession. The scheme also provides for the employment of midwives for affording maternity relief to the rural female population.

The places for the location of rural dispensaries under the scheme are selected by the respective local boards in consultation with the District Medical Officers and the Surgeon-General and the practitioners are also appointed with approval of the District Medical Officers and the Surgeon-General. The practitioners appointed under the scheme are private medical men who have come to an agreement with the local boards and the Government to settle permanently in specified villages and treat the necessitous poor free of all charges at the dispensary at the hours prescribed, in return for the subsidy paid by Government. Subject to this provision, the practitioners are entitled to charge fees from well-to do patients for professional services rendered and medicines supplied. The liability of the Government on account of the scheme is restricted to the payment of a subsidy to the practitioner and the midwife. Local bodies have to supply medicines and drugs to the value of Rs. 360 per annum which has been considered sufficient to treat 30 patients per diem. Local boards are also permitted to open additional rural dispensaries in consultation with District Medical Officers and meet the entire expenditure on account of the dispensaries including the subsidies to the practitioners and the midwives.

Medical Relief Subsidies

The rates of subsidy granted to these medical practitioners and midwives of rural dispensaries are as follows:—

	PLAINS PER ANNUM RS.	AGENCY AREAS PER ANNUM RS.
(1) L. M. P.s ...	500	600
(2) Medical graduates ...	600	700
(3) Midwives —		
First class ...	300	—
Second class ...	200	—

Additional subsidy not exceeding 50 per cent. of the Government subsidy is also granted by local boards from their own funds to medical practitioners for remoteness or unhealthiness of the locality or for any other special reason if qualified men are not forthcoming for appointment.

The practioners are if required either by the President of the Local Board or an officer of the Public Health Department to attend to inoculation work, fairs and festival duties, paid by the district board necessary remuneration therefor. Considering the fact that rural medical practitioners can best utilize their leisure hours for public health work, the Government have, as an experimental measure, permitted local boards the deputation of medical practitioners of two dispensaries in each district for furtherence of public health work for which they are paid an inclusive honorarium of Rs. 15 per mensem from the local board funds. The scheme is under trial.

As an impetus to medical practitioners of rural dispensaries the Government have commended to the local boards to consider the claims of medical

practitioners of rural dispensaries for appointment as Sub-Assistant Surgeons in regular (local fund) dispensaries when vacancies occur.

The number of allopathic rural dispensaries now working is 407 subsidized by Government and 63 subsidized by the local boards. The amounts provided in civil budget estimates for five years from 1930-31 for the payment of subsidies to medical practitioners and midwives are roughly as shown below:—

	RS.
1930—31	2,36,3.0
1931—32	2,32 200
1932—33	2,94,600
1933—34	2,89,0.0
1934—35	2,89 000

Many of the rural dispensaries are working satisfactorily and the local boards have also appointed servants and compounders where the attendance is large, and as a successful working of the scheme, the rural dispensaries where there is a large attendance have been converted into regular dispensaries.

Drive Against Leprosy

Public Health—Leprosy was considered to be incurable and the majority of the afflicted resigned themselves to their fate. Many were unwilling to disclose the disease and seek proper treatment. The position has changed since it was found that leprosy is curable in early stages and can be arrested. Government are now affording the maximum facilities to Government servants suspected of this disease in the matter of leave. In connection with the measures to be taken to combat the spread of leprosy in the Presidency it was pointed out to Government in 1926 that, to attain success in the anti-leprosy compagin, it was essential that the disease should be diagnosed and treated in its early stages. As the ability to diagnose the disease can be acquired only at a well-organised clinic it was suggested to Government that leper clinics should be opened and out-patient treatment introduced by degrees in all headquarters hospitals commencing with those hospitals to which medical schools were attached. In 1927 Government accordingly sanctioned the opening of five dermatological clinics in the headquarters hospitals at Tanjore, Madura, Vizagapatam, Coimbatore and Guntur. A leprosy clinic was opened at the Taluk headquarters hospital at Krishnagiri (Salem district) with the aid of contribution from Leprosy Relief Committee.

For the reduction of the incidence of leprosy in the Presidency a subsidiary scheme was submitted to Government in 1931. The scheme was to divide the Presidency into six groups and each group to be in charge of a trained special officer of the rank of a Sub-Assistant Surgeon. The duties of the special officer are—

(1) to open leprosy clinics at important centres where the disease is endemic;

(2) to train medical officers in leprosy work; and

(3) to do propaganda and survey work.

One of the groups is under the charge of a special officer who is styled as Chief Leprosy officer under whose instructions the other officers carry on the work.

The effect of this scheme which was sanctioned by Government and introduced in 1931 is that leprosy clinics have been opened in all Government medical institutions. Ths local boards appreciating the useful work done to lepers, sanctioned amounts for opening clinics in the medical institutions under their control. The total number of clinics now operating in the Presidency is 445. The popularity and efficiency of the clinics have gradually increased. The Group Leprosy Officers continue to carry on propaganda work in the villages with a view to popularize clinics. They have also commenced the villagewar registration and are following up in the villages those patients who are indifferent to treatment. Another activity in which the Group Leprosy Officers are engaged is the examinations of students for signs of leprosy. A striking feature in the leprosy campaign conducted is the formation of the district leprosy organizations in accordance with the resolution of Calcutta and Madras Leprosy Workers Conference held in 1933 with a view to maintaining sustained anti-leprosy activities in each district. A big leper settlement at Tirumani costing nearly Rs. 1.50 lakhs is being maintained at Government expense. A large number of medical officers have been trained in the treatment of this disease. Instructions to the medical

officers were sent through circulars and pamphlets issued by the Chief Leprosy Officer. It will be seen from the above that Government have been spending a large amount of money for leprosy relief in recent years.

There are 31 rural dispensaries in this district under the control of the district board subsidized by Government. Twenty-five of them are allopathic and six are of Indian medicine. On an average 212,160 patients in a year receive medical aid at these dispensaries. Thirteen midwives are also working in these dispensaries to afford maternity relief to the rural female population. A sum of Rs. 19,600 is paid annually by Government as subsidy.

—*Hindustan Times.*

PUBLIC HEALTH IN SOVIET RUSSIA

At the invitation of the People's Commissar for Public Health in the Union of Soviet Socialist Republics, the Bureau of the League's Health Committee, assisted by several experts, held one of its periodical sessions from June 22nd to 29th last in the palace of the People's Commissars at Moscow. The People's Commissar Kaminski and the members of the Narkomsdrav took part in the discussion, which related mainly to rural hygiene and nutrition. These are subjects on which the Health Organisation already has the advantage of the co-operation of experts and of specialist institutions in the Union of Soviet Socialist Republics.

After the Bureau's session ended, several members and experts were invited by the Commissar of Public Health to make a tour of the Union of Soviet Socialist Republics, thus visiting Leningrad, Gorki, Rostov-on-the-Don, Tiflis, Batoum, Sotchi, Yalta, Zaparoje, Kiev, Novorossik and Sebastopol.

It appears that, as a general rule, the proportion of funds allotted to public health in the budgets is as much as 35 per cent.

The problem of free medical attention has been effectively settled. The work done on behalf of women before, during and after childbirth is to be noted, and also the manner in which the hygiene of maternity has penetrated even as far as the Kolkhose. In many cases, the expectant mother can obtain a midwife and come to lie in at the maternity home of which the latter is in charge.

As regards infants, creches and welfare centres are found throughout the country. The 1937 plan provides for a large increase in the number of these centres. This shows the interest taken by the Government in the health of the very young.

The same interest is displayed on behalf of the school child and the adolescent, as is shown by the pioneer camps and the development of physical training in the Union of Soviet Socialist Republics.

The interest taken in the health of the worker is no less manifest, as is shown in the growth of a watering-place and health resort like Sothci. The huge sanatoria, where treatment is combined with rest and recreation, are centres of recuperation which have a most benefical influence on the capacity for work of the individual.

Special attention was paid by the Health Committee to the subjects which it is already investigating with the help of Soviet Union specialists, such as biological standardisation, the anti-malaria campaign, nutrition and housing.

For biological standardisation, the Soviet Union has at Moscow an institute for controlling sera and vaccines, which uses the international standards

established by the Health Organisation when testing sera prepared by the many bacteriological institutes within the Union. The output of these institutes is considerable, as may be seen from the number of preventive inoculations against typhoid, dysentery, diphtheria and rabies, not to mention small-pox vaccination, which is compulsory.

In connection with the campaign against malaria the group visited the Sormovo zone near Gorki, in which experiments are being made, in close contact with the Health Committee's Malaria Commission, as to the therapeutic value of new synthetic medicines suitable for replacing quinine. A large number of clinical observations have been made by malario logists in the Union of Soviet Socialist Republics, and the results will complete the information on which the new report now in preparation by the Malaria Commission will be based.

In nutrition the Union of Soviet Socialist Republic has made some interesting innovations. The collective kitchens and factory restaurants, with suitable food for the workers whose physical condition is specially in need of such, are worthy of attention. The scientific basis for this mass feeding is furnished by the research work of the Institutes of Nutrition of which the oldest established is in Moscow. The problems which will require further study are those of the food ration and town planning and housing. Factories, houses and flats have been built in large numbers. Arterial roads have been pierced. A further plan of extension has been drawn up providing for additional buildings and underground lines. The League's Health Organisation will be able to benefit from the help of the Soviet Union's architects, engineers and health experts in the study of various problems of urban housing.

Now that hygiene is being a more and more important factor in rural life, thanks to the action of the Kolkhoses, the whole question of making housing conform to the laws of health. This is a matter in which assistance of the health specialists and sanitary engineers of the Union of Soviet Socialist Republics with the experience they have acquired, will be of value to the Health Organisation in its international work on rural hygiene and housing.

At the end of their tour, the members of the Bureau and the experts sent the following telegram to the people's Commissary for Public Health of the Union:

"We leave the country deeply impressed by the remarkable accomplishments effected on a large scale both as regards health and social action. Our tour has been both interesting and instructive. We are convinced that the health programme now being carried out will help to render the peoples of the Union of Soviet Socialist Republics healthier, stronger and happier. May we congratulate you on your tenure of the office of People's Commissar for Public Health in the Union.

UNEMPLOYMENT IN THE MEDICAL PROFESSION

The desicion of the Indian Medical Association to institute an All-India enquiry into the conditions of employment and unemployment of qualified medical men is a step in the right direction. The starting of the enquiry is itself a portent and a sign of the times. Time was when, as soon as a medical student got his degree, he could straightaway step into a post in the Government service on a decent starting pay and with excellent and assured prospects of working through the time scale to a four-figure salary by the time for retirement. In addition, the fortunate medical service man of those Halcyon days, what with the comparative paucity of private medical practitioners and his exclusive command of the medical and other facilities of the Government hospital under his charge, was able invariably to establish a lucrative private practice which brought him a tidy bit of extra income, often exceeding his service emoluments. In short, as compared with the hard lot of medical men of these

days, the doctors of a decade or two back were on velvet, and the medical servicemen or private practitioner who did not retire with a large fortune was a rarity and a museum-piece.

Times, however, are sadly changed now. While service openings and private practice opportunities have expanded to a certain extent in response to the increased medical needs of a growing population, the yearly output of qualified medical graduates which has increased almost in geometrical progression is such that the average income of members of the profession has been reduced greatly. At the same time, the cost and length of period of medical education have gone up, so that the capital outlay required for the securing of medical degree has gone up inordinately. In fact, so acute is the competition in this sphere, that the young medical man with ambitions to achieve something more than a humdrum country practice has invariably to secure in addition an expensive foreign qualification, however trumpery it may be, before he can aspire to rise above the groundings of the profession. This apparent glut of medical men has led in a degree of unemployment in the profession—but this phase is transient and more apparent than real. What has happened is that medical men, who have been exploiting their scarcity value, are now compelled to make sensible readjustments to the new forces moulding the economic and social life of the country.

Before we pass this phase of the subject, reference, however has to be made to a number of other factors that are also operative in producing a measure of distress among the votaries of the profession. Apart from the increase in the number of qualified allopathic practitioners, the revival or the fresh introduction of a number of competing systems has served to undermine the position and prestige of the exponents of the allopathic system. The strong resurgence of the Ayurvedic and Unani systems, a movement to which considerable momentum has been imparted by the awakened spirit of nationalism in the country, the growing and insistent challenge of homoeopathy, the emergence of a number of faddist systems—such as nature-cure, water-cure, mud baths and packs, and the ubiquitous menace of patent medicines have wrought sad havoc in the income standards of the allopathic practitioners, and this inspite of the considerable support that they derive from Government recognition and patronage. The profession is thus facing phenomenal difficulties, and it is well that resources are pooled and a collective effort is being made to tackle the growing incidence of unemployment in the profession.

To our mind, what is needed at the present, is a reorientation of the medical man's outlook on social conditions and his own individual niche in society. With conditions as they are in India, a superfluity of qualified medical men in the country is a practical impossibility for decades to come. The growing medical needs of the immense Indian population, the preponderant part of which lives in rural areas, require the services and careful ministrations of many times the present number of doctors. Secondly, the profession must reconcile itself to a modest standard of income, more in keeping with the average incomes in other professions and the general poverty of the country, and not hanker after the fortunes earned, mainly through exploitation of scarcity value by an earlier generation of doctors. Thirdly, more, and yet more doctors must live and practise in the country, abandoning the miserable futility of street-corner practice in urban areas, by so doing they will not only be holding themselves, but would also make valuable contributions to the improvement of rural health and sanitation and to the development of a more efficient system of social services. Fourthly, it is essential that efforts should be made to lessen the present prohibitive cost of medical education without impairing its quality in the least. An important step in this direction is the eschewal of the craze for cheap foreign degrees. For specialisation in particular fields of intensive medical studies, it would doubtless be still necessary to repair to foreign centres of medical instruction like London, Paris and Vienna,but the vogue for trumoery foreign qualifications is an expensive futility which ought to be serverely discouraged. Fifthly, it is essential that the authorities should abandon its policy of meaningless preference for foreign medical degrees and assess at their full and real value medical degrees granted by competent Indian universities. If along with this, the Government would tighten up the regulations against medical practice by quacks and patent medicine hawkers, much could be done to improve the lot of Indian medical men. —*National Call.*

MEDICAL NOTES AND NEWS

INDIAN RESEARCH FUND ASSOCIATION

A Press 'Communique' says:—

A special meeting of the Governing Body, Indian Research Fund Association, was held in Simla on September 27, 1936, under the presidency of the Hon'ble Kunwar Sir Jagdish Prasad, Member-in-Charge of the Department of Education, Health and Lands.

Before taking up the business items on the agenda, and in response to a proposal made by Major-General Sprawson, the Governing Body passed a resolution expressing their deep regret at the untimely death of Lieutenant Colonel R. Knowles, I.M.S., one of the Association's most eminent research workers.

It will be remembered that since 1932—33, the Government of India have not found it possible to give any research grant to the Indian Research Fund Association. In view of the rapidly diminishing funds, the Governing Body has been compelled to consider the desirability of restricting its research activities and to this end, at its meeting in March, 1936, appointed a Sub-Committee to scrutinize the research programme and to recommend, if possible, reductions in expenditure. Consideration of this Committee's report was perhaps the most important item on the agenda of the present meeting. After some discussion, the Governing Body decided to remit the Sub-Committee's report to their Scientific Advisory Board which meets in December and instructed that Board to take the report into consideration and to make recommendations. The Scientific Advisory Board was also asked to draw up its programme so as to indicate the order of urgency or importance of the enquiries recommended. By having a priority list the Governing Body will more easily be able to come to a final decision should it be found necessary still further to curtail expenditure.

Grant for Anti-Malaria Work:—With reference to the special grant of Rs. 10 lakhs given during the present year by the Government of India mainly for anti-malaria work in rural areas, the Governing Body decided to allocate this amount as follows:—

(i) Eight lakhs to be allocated for provincial schemes approved by the President after scrutiny by the Public Health Commissioner, due consideration being also given to the anti-malaria organizations in existence in each province.

(ii) One and a half lakhs to be set aside for furthering the recommendations of the Nutrition Advisory Committee. The report of this Committee, concerning which certain details have already appeared in the press, was adopted and the Committee's recommendations are now being carried into effect. It will be remembered that the chief proposals made by the Committee were:—

(a) To extend field work with special reference to study of method of assessing the 'State of Nutrition" and dietary requirements in relation to Indian conditions.

(b) To undertake (a) nutrition surveys amongst school children and surveys of dietary habits, and (b) survey of deficiency diseases.

(c) To find out cheap source of Vitamin 'A' and carotene.

(d) To investigate the possibilities of supplying soya bean and milk in large quantities.

(e) To propagate knowledge in regard to nutrition.

Rates of pay for Non-Government Servants:— The question of rates of pay for non-Government workers for the Association is one which has been under consideration by the Governing Body for some time past. Incremental scales, drawn up to meet the conditions of research workers and comparable with similar scales for Government servants, were finally sanctioned by the Governing Body at this meeting.

For the same class of workers, the institution of a provident fund was accepted in principle, but a final decision was postponed in order that more detailed estimates of costs, etc., might be prepared.

The Constructional Sub-Committee appointed by the Governing Body in 1929 to deal with the management and construction of the all-India Institute of Hygiene and Public Health, Calcutta was dissolved, its duties being considered to have been completed. The balance of Rs. 1,40,158 remaining in the hands of the Committee was ordered to be transferred to the Governing Body and placed in a separate account. Two sections of the All-India Institute remain to be equipped and the available balance will be required for this purpose as well as for other improvements.

INDIAN SCIENCE CONGRESS

The Executive Committee of the Indian Science Congress Association in consultation with the Council of the Association, it is understood, have decided to hold the jubilee session of the Indian Science Congress 1938 jointly with the British Association in Calcutta.

To total expenses of the session are estimated to be Rs. 1,10,000. The Government of India have promised to contribute a sum of Rs. 20,000 for the purpose, while other promises include that of the University of Bombay Rs. 2,000, the Calcutta University Rs. 5,000, the Mysore University Rs. 500, the Annamalai University Rs. 100, and the Local Committee of the Indian Science Congress Association, 1936, Indore Rs. 1,000.

The Government of Bengal have been approached for a substantial contribution towards the cost. The University of Calcutta have also promised to help the Congress in raising the required sum of money and if necessary to make an additional grant to the Congress.

It is understood that His Excellency the Viceroy who has consented to be the patron of the Jubilee session of the Congress will be approached to open it.

It has been proposed that the Vice-Chancellor of the Bombay University will, on behalf of the Congress, receive the foreign delegation which will consist of 50 eminent British and 10 non-British scientists on their arrival at Bombay.

The British Association, it is reported, have enquired of the Indian Science Congress as to persons whose presence in the delegation will be welcomed by the Indian scientists.

A provisional tour programme has also been drawn with a view to enable those foreign delegates to visit most of the scientific centres in India. The delegates will be split up on two or three occasions in two parties otherwise the whole party will travel together. They will halt for three days at Bombay and may visit Poona for a day. They will arrive at Delhi by two alternative routes via. Indore and via. Boroda. They will halt at Delhi for two days and then visit such important scientific centres as Lahore, Allahabad, Lucknow and Benares.

After the session is over the delegates will commence their Southern India tour visiting Madras, Nagpur, Hyderabad and Bengalore before sailing for Europe.—*A. P. I.*

MALARIA CONTROL IN DELHI

A Press 'communique' says:—

The Government of India have appointed a Committee to study the malaria problem of Delhi from the point of view of permanent protective measures.

The Committee will consist of the Public Health Commissioner to the Government of India (Chairman), a representative of the Chief Commissioner, Delhi, the Chief Engineers, Central Public Works Department, Delhi, North-Western Railway, Irrigation Departments, the Punjab and the United Provinces, the Director, Civil Engineering, Railway Board, the Engineer, Delhi Municipality, the Engineer to the Malaria Survey of India, the Divisional Superintendent, North-Western Railway, Delhi and the Director of the Malaria Survey of India, as Secretary.

The Committee will give advice as to the best method of disposing of the storm water drainage of the whole of the Delhi urban area, and will consider and report upon the feasibility and approximate cost, etc., of constructing a bund along the

right bank of the Jumna from the North-Western Railway bridge to Okhla headworks, with a view to preventing the flooding of the Bela. They will also consider and report upon the feasibility of cutting off the Western Jumna Canal at Pambarl Bridge and filling in the bed of the canal from that point to its termination.

It may be recalled that the Government of India have recently been considering the question of the control of malaria in Delhi and a Malaria Officer and an Engineer have been appointed under the general supervision of Lt.-Col. G. Covell, I.M.S., Director of the Malaria Survey of India, to carry out temporary measures of protection and study the problem from the point of view of permanent protective measures. Col. Covell's first inspections have led him to the conclusion that the question of permament protection is linked up with consideration of certain broad measures on which responsible and technical advice is an essential preliminary. A variety of interests are involved and it has therefore been considered important that these interests should be represented in the proposed enquiry. It has also been thought that for any such enquiry to yield the best result it should be held while monsoon conditions obtain in Delhi.

PUBLIC HEALTH SCHEME FOR RURAL MADRAS

In July, 1934, the Government commended to District Boards the suggestion of the Director of Public Health, that the service of rural medical practitioners could be utilised for the furtherance of public health work under the guidance of District Health Officers and requested them to give it a trial for a period of two years in the case of two dispensaries in each district selected in consultation with the District Health Officers. The Director of Public Health reported that the period of two years was mostly spent in inducing the District Boards to undertake the scheme, to select suitable centres, to train and equip the rural medicial practitioners in public health work, and that with the groundwork hitherto done, very useful work could be turned out in future. The Government have sanctioned the extension of the scheme for a period of two years.

SOKHEY VERSUS MEHTA

At a joint meeting of the Indian and European Progressive Groups held recently at Bombay, Lt.-Col. S. S. Sokhey enumerated the numerous advantages of using contraceptives. Like everything else, these also could be misused.

The advantages are: (1) proper spacing of pregnancies. Maternal mortality was very high in India. Pregnancies at short intervals did serious damage to health, and the people sometimes resorted to injurious methods of terminating unwanted pregnancies. Secondly, birth control methods enabled parents to have just the number of children they felt they could bring up decently. Thirdly, the death-rate could be lowered. It increased as the number of children born in a family increased. Fourthly, the methods enabled young couples to know each other well before settling down in life. Fifthly, the health of parents was safeguarded.

Over-population in India was a pressing problem. Further additions could only lead India to greater depths of degradation. Unless the problem received adequate and immediate attention, it would always stand in the way of all schemes devised to secure the economic betterment of people. There was no immediate prospect of increasing the means of substance of people and there was no possibility of emigration on a large scale from the country. Therefore the only possible course was to restrict the increase of population. And it was by far the better plan to achieve this restriction by deliberate human planning than to await on famines and pestilences to do it. And this could be done, since the methods were effective, perfectly harmless and reasonably inexpensive.

Dr. Sir Mangaldas Mehta, opposing the introduction of birth-control methods said that birth-control had come to stay but what good it could do India, time alone could show.

The appeal of its advocates centred round one point alone,—the poverty of India; but they had to contend with several of its aspects, of which the religious and the ethical were perhaps the most difficult to surmount. None denied its advantages on medical grounds; they also asked whether these advantages could not be obtained by other means

which did not touch the religious susceptibilities of the people or affect the moral fibre of the nation. Illiteracy of the masses had also been mentioned as the greatest obstacle in the propaganda of birth-control. If literacy could help the propagation of birth-control, could not literacy secure the advantages of birth-control without resorting to birth-control? Many felt that it could, if education was of the right type.

If suicide and homicide are held in horror all the world over, is it fair to strangle a life even when it is unborn? The Indians shrink from the idea because it amounts to homicide.

Rendering harmless the effects of passions let loose, was one way to get out of the difficulty of increasing population and increasing poverty; would not harm result from passions so let loose and must they really be permitted to have full scope for their display?

Curbing did not repress the instinct. It made the moral fibre stronger; it built up character. Apollo and Venus never needed birth-control methods; they knew better how to hold themselves.

The factors that held persons of both sexes in check in a crowd could operate or could be made to operate in the loneliness of a home of two persons. "We want literacy, but we want it of the right type—the one that will help us to hold our head higher and not reduce us to the level of animals, India requires men of the right type. Let us have the correct education and by 'us', we mean both men and women."

The marriage age had advanced and that too in the most difficult period of life. "Go to any of the Colleges where formerly fathers of one or more children were often found keeping their terms for Law or Arts, we find bachelors and spinsters of the ripe age, and showing better health than those who are married and settled in life; it is ambition and not fear of a large family that has brought about this change. Let there be ambition in married life and we would not be surprised if the couple never find the necessity of birth-control methods."

In the advocacy of birth-control methods the woman was often pictured as the victim of the brute instinct of man. It was the instinct of motherhood that made the woman meet the advances of man in the correct and religious spirit. She looked far beyond the act and visualised to herself the baby that was yet to be born, even if it was the 20th one. She forgot those she had reared and helped on into the world and turned for consolation and happiness to similar ones that were to come into the world. Birth-control methods would make her lose interest in family and what was intended to be a blessing would prove a curse to womanhood and motherhood. If healthy babies were to be reared, the instinct of motherhood must be kept perpetually alive.

"If we are to be a Nation, we want both women and mothers who know how to hold themselves in check. It is not women that require education but it is the men that require correct occupation to keep their minds off trivial affairs."

Birth-control methods were still in their infancy and much data had to be collected before they could be assigned a value in nation-building activities.

"I might mention here that the lady doctors in charge of the Maternity Homes of the Bombay Presidency Infant Welfare Society have expressed their opinion definitely against the use of contraceptives for the class of women they have been dealing with for some years.

After some discussion, the meeting terminated.

MEDICAL INSPECTION OF SCHOOLS

A conference of the Director of Public Health, Bengal, the Director of the All-India Institute of Hygiene, the Health Officer, Corporation of Calcutta was called at the Central Municipal Office on Tuesday, the 8th September, with the Education Officer as Convener and Chairman.

Dr. R. B. Lal (Director, All-India Institute of Hygiene), Dr. L. M. Biswas, (Health Officer, Corporation of Calcutta) attended. Major Chatterjee (Director of Public Health, Bengal) was unavoidably absent.

At the outset the Education Officer placed before the conference his scheme for medical inspection in Corporation Free Primary Schools as published in Part II of his report on the schools he had

visited in Europe, which embodies his recommendations. A short report containing information with regard to the medical inspection in schools in Sweden, England, Scotland and France as also the Indian cities of Bombay, Madras, Lucknow and Cawnpore was drawn up by the Education Officer and placed before the conference.

Dr. Lal referrred to the work he had done in connection with the control of epidemics in the southern part of 24-Paraganas and suggested that intensive work might be done in Calcutta to determine how infection was spread in and from the schools. After some discussion it was decided that the best plan would be to take representative samples from different parts of the city and carry an intensive survey with regard to such samples. It was proposed to select 3 groups of 1,000 school children each in three areas in the city and place them under three medical units, consisting in each case of a Medical Officer on Rs. 150 per month, three qualified medical inspectors (L.M.F. or Sanitary Inspectors) on Rs. 70 per month. It was also recommended that there should be at the head office two clerks to look after the correspondence and records, and one Bacteriologist on Rs. 150 per month to make the necessary examination of blood, sputum, urine etc. The Survey would include not merely medical examination of the children at school to find out the cases of sickness but would be extended to enquires at their residences to ascertain the nature of the contact responsible for such sickness. A certain amount of help with regard to the treatment would also form part of the duty.

A recommendation to the above effect will be placed before the Public Health Standing Committee. As the terms of reference did not include the question of general medical inspection of school children, this aspect of the matter was not discussed.

The problem of medical inspection of schools and of children is of very great importance. An intensive survey, which, of course, is the only possible way to collect data with regard to the particular problem for which the conference was called by the Public Health Committee takes into account only one part of the work. The Education Officer, it may be stated, had submitted a scheme of medical inspection of Corporation Schools as early as 1929. Subsequently, he prepared another report. The latest proposal was submitted in May, 1935. No scheme has, however, been so far adopted by the Corporation and absolutely no work has been done. Surveys by the British Empire Leprosy Association and also by different bodies carrying out investigations with regard to Tuberculosis have shown that these diseases are by no means absent amongst the staff and pupils of Corporation schools. The danger to the health of the children from persons suffering from such diseases at school cannot be ignored. With the introduction of compulsory education in a part of Calcutta and the proposal for its further extension, it has become necessary, we feel, to undertake medical inspection and arrange for segregation of persons suffering from such or any other communicable diseases. (*Calcutta Municipal Gazette*: 12th September, 1936: pp. 665:)

HIGHER MEDICAL EDUCATION FOR LICENTIATES.

The Calcutta University, on a representation from the Calcutta Branch of the All-India Medical Licentiates Association, has recently cut down the course of study from 5 to 4 years for the L.M.F.'s going in for the final M.B. Examination for those whose preliminary qualification is I.Sc., and to 3 years for those who will pass the new I.Sc. (with practical examination).

The Association appealed to the University to allow the Licentiates to go up for the final M.B. examination after two years' study as allowed by the Madras University.

The Vice-chancellor Mr. Shyama Prasad Mukherjee, who was moved again by the Association, was pleased to receive a deputation of the Association represented by Rai Sahib Dr. Probodh Chandra Roy, Dr. Amulyadhan Mukherji and Dr. Amrita Nath Roy on Friday, the 2nd October '36 at his office and discussed all the points stressed by the deputationists and asked them to submit some details which he would consider for granting further relief to the aspiring licentiates who want to proceed with higher studies.

ANTI-INDIAN MEDICAL COUNCIL DAY

A largely attended meeting of the medical profession of Calcutta and its suburbs was held on 20th September, 1936, at the Indian Medical Association Hall under the joint auspices of the Calcutta Branch of the All-India Medical Licentiates Association and the Indian Medical Association to protest against the anti-Indian character of the Indian Medical Council Act passed in 1933.

Dr. J. C. Chatterjee, member, Bengal Medical Council, was voted to the chair.

The following resolution was moved by Dr. A. D. Mukherji, Member, Bengal Medical Council:—

"This meeting of the members of the medical profession of Calcutta and its suburbs places on record its strong disapproval of the Indian Medical Council Act of 1933 which was passed contrary to the wishes of the independent medical profession.

This meeting is of emphatic opinion that the Act be amended in such a way as to make the Council a true representative of the medical profession of India by including Licentiates who form by far the larger representation of elected members in the Council."

In moving the resolution, Dr. Mukherji told some thing about the genesis of the Indian Medical Council Act, how in the teeth of opposition this Act was passed. How the standard of medical education in the schools deteriorate, if the medical licentiates were not included within the purview of the Indian Medical Council.

In seconding the resolution, Dr. T. N. Ghosh, Secretary, Indian Medical Association (Calcutta Branch) laid much stress on the utility of the concerted section of both associations in protesting against this inequitous Act of the Government of India.

Dr. A. B. Mukherjee (Burdwan), Drs.A. N.Roy and S. C. Roy also addressed the house. Every one of the speakers was of opinion that a central organisation should be at the head to guide the policy of medical education in both schools and colleges, as otherwise the standard of medical education was sure to deteriorate and there was no hope of raising the standard as was proved by the action of the Provincial Governments which have resisted so far the demand of the Licentiates to raise their standard of education and qualification to a reasonable minimum.

With a vote of thanks to the chair, moved by Dr. K. P. Sen, the meeting terminated at 9 P.M.

* * * *

A meeting of the members of the medical professon of Saharanpur was held on September 20th 1936 to observe "Anti Indian Medical Council Day."

The following resolution was unanimously passed:—

"This General Meeting of the Medical Profession of Saharanpur held under the joint auspices of the Saharanpur Branch of the Indian Medical Association and the All-India Medical Licentiates Association places on record once again its emphatic protest against the Indian Medical Council Act of 1933 and urges on the Government of India the necessity for amending the act forthwith so as to include the Indian Medical Licentiates within its purview and thus allay the discontent and dis-satisfaction in its rank and file and the bulk of the Independent Medical Profession.

MILK SUPPLY FOR CALCUTTA

Mr.Bhaskar Mukherjee, Acting Secretary to the Corporation of Calcutta, has sent the following note to Swami Vishwanand in connection with the question of supply and disturbution of milk in Calcutta raised in the letter of Mr. Naraindas Bajoria published in the Calcutta papers under the title of 'Slaughter of Prime Dairy Cattle':—

Regarding milk supply special provisions for steps to be taken for the supply of milk to the city were incorporated in the Calcutta Municipal Act of 1924. The Calcutta Corporation did something at the beginning, namely by assisting the Government Co-Operative Milk Society's Union, an organisation which is run by the Government of Bengal. This was a step in the right direction. Much more are however, actually needed. The present state of affairs may be judged by the following facts. While

milk sells at 4 seers per rupee in Calcutta one can get 12 seers per rupee within 30 miles of the city. Surely the cost of conveyance cannot account for the tripling of the price.

Milk sells in London at approximately 7 seers per rupee, and one seer of London milk has three times the nutritive value of one seer of Calcutta milk. Yet with the bulk of the population in London, beef is a stable article of diet, whereas the bulk of the population in Calcutta worship the cow, I do not think I could have placed more convincing facts. Steps are urgently necessary to improve this state of things. The problem is acute.

Yet the problem is by no means difficult. Extensive areas of aerable and pasture lands are available in the immediate vicinity of Calcutta for a dairy sufficient to meet the needs of the city. The prices of land are still cheap and transport cannot be difficult.

If the Calcutta Corporation is able to start and manage such a dairy much of the evils associated with the present system of milk distribution namely the "phooka" practices resorted to by a certain class of milk vendors and the uneconomic slaughter of animals would hardly be necessary. To eradicate the disease, preventive measures are actually necessary. If suitable preventive measures are taken the disease would die a natural death.

ASSOCIATION NOTES

CALCUTTA BRANCH

At a Seminar meeting of the Calcutta Branch, I. M. A. held on the 13th August, 1936, Dr. R. Ahmed, D.D.S., F.I.C.D. delivered a lecture on the Role of Oral Sepsis in General Practice.

The Role of Sepsis in General Practice

Focal infection has been established as an important factor in the etiology of disease. So much evidence to this effect has accumulated in recent years that progressive physicians are well aware of the situation. There are several foci of infection, among which the tonsils, the accessory nasal sinuses, the prostate gland, the uterine cervix, the pharynx, the teeth and periodontal structures and more rarely the gall-bladder and appendix deserve more than a passing mention.

The situation as far as the teeth are concerned is perfectly clear in one regard, namely, that periapical infections from gingivitis and pyorrhoea may contribute substantially to the origin and course of numerous diseases. But there are other dental conditions which are often overlooked, the most important of which are:

(a) Periapical infections from filled teeth or non-vital teeth.

(b) Periapical infections from crowned teeth.

(c) Soft granuloma in apparently healthy teeth.

(d) Impacted teeth.

The absence of teeth does not exclude dental infection. In fact in about 30% instances in which all teeth have been extracted, radiographic examination will disclose retained roots. These roots are usually infected.

It is reasonable to suppose that casual inspection of teeth to determine sources of dental infection is as valueless as casual inspection of the thorax to determine heart disease. Experienced physicians will agree that the trained dentist who has knowledge of dental radiography and examination can only give a valuable opinion regarding teeth and contiguous structures. A question which will arise in the mind of an alert physician is that should the dental conditions mentioned above be corrected

even in the face of the excellent general condition of the patient? I feel we cannot give an unequivocal answer. As we all know, many persons are able to withstand infections of a dental origin for many years as a result of a high degree of resistance. You are familiar with the controversy relative to the need of tonsillectomy when tonsils appear to be infected. Similarly, with regard to "silent" dental infection, a conservative attitude may be taken that all sources of infection should be eliminated if such is possible, without destroying the function, beauty and comfort of the natural teeth.

When evidence of definite systemic complication exists in the presence of oral infection, it is my considered opinion that the focus of infection in the mouth should be completely eliminated. Conservative treatment in such cases is not advisable. Even at the expense of repetition I would like to quote that classic passage from Grieves, "There is to my knowledge, no medicament nor method, germicidal, oxidising or electrolytic, that will revivify the pericemental membrane. If it be vital, the tooth is healthy, if it be diseased, the tooth is next to doomed. This is the point in treatment where materia medica stops and good surgery begins". This observation has stood the test of clinical experience of many years and many of us could cite case reports to support the above statement. The following case reports may prove interesting.

Case 1. Patient, male, age 45; acute inflammation of retina and sclera of the right eye, compelling him to remain in darkened room for weeks. 1st molar and 1st bicuspid, the only teeth in the maxilla were extracted. The condition cleared up in one week. Five rabbits were inoculated with the culture made from those infected teeth and all developed the same condition.

Case 2. Reported by Price in the *Journal of the American Dental Association*. The history of the case is that about four weeks previously a boy suffered from acute toothache, which was located in the 1st permanent molar in the mandible on the left side. About a week after he developed acute rheumatism and myositis which gave him admission to the Hospital. Serious heart involvement and enlargement was discovered with the apex definitely rotated outwards. The acute condition subsided in ten days and the boy returned to school. The suspected tooth was extracted and the pulp though not exposed was heavily infected as was proved by cultures which showed streptococci. Rabbits were inoculated, 93% developed acute rheumatism. Incidentally, the boy died in about seven months from acute endocarditis.

The above two are acute cases. In many cases of ill health which clear up after adequate dental treatment, the sepsis is of a low form, in which the organisms cause no definite secondary focus until some part of very low resistance is found. The following case, reported by Steadman, is very interesting:—

"A powerfully built man, in apparently robust health about 40 years of age, was one day stepping off the kerbstone into the street, when he suddenly became aware of a motor bus bearing down rapidly upon him. He sprang sharply back on to the kerb and in doing so slightly strained his left knee. The injury was so slight that he thought very little about it and continued his usual occupation for that day. Three or four days later, however, he was admitted to the Charing Cross Hospital, under the care of late Dr. Montague Murray, suffering from acute suppurative synovitis of his knee joint. He was transferred to the surgical side and the leg was eventually amputated. The interesting point in this case, is whence had come the infection? At the time of the accident his leg was not knocked in any way, there was, therefore no external injury. Dr. Montague Murray made a thorough examination of his whole body and could find no focus of infection. He then asked me to examine his mouth, whereupon the source of infection was immediately evident. He had a very advanced pyorrhoea alveolaris, his mouth was in a filthy condition, with deep pockets streaming with pus all round his teeth. The explanation given by Dr. Murray was that the "strain" had injured some tissue cells in the immediate neighbourhood of the joint and thus lowered their vitality and resistance to invasion by micro-organism. Consequently, the micro-organisms floating in the blood stream from his oral sepsis gained a foot with the disastrous result that followed."

I have no doubt you can cite from your own experience cases like the ones I have cited. I would not like to take up any more of your time with case reports. Before closing I would like to

draw your attention to one aspect of the dental problem which is of interest to the physician, and which could not be solved without his co-operation. As far as present researches go, we are of the opinion that dental decay is associated both with environmental factors related to food retention and lactobacillus fermentation and with physiologic factors related to calcium-phosphorus metabolism. Since calcium phosphorus metabolism is well within the realm of medical activities the responsibility for this phase of dental caries must be accepted by physicians. I will give an example. It is often thought that the responsibility of keeping the mouth free from disease, rests upon the dentist only. But this is not correct as many dental diseases begin in intrauterine life or in infancy or childhood when the little patients were solely under the care of the physician, as far as health is concerned. The tooth which we replace by a denture say at the age of 35, was a pulpless tooth at the age of 18. The pulpless tooth of 18 years of age was a decayed tooth at the age of 8. The decayed molar of 8 years of age erupted into the mouth at 6 years of age and was being formed at birth. Years before the mother takes the child to a dentist the chewing surfaces of the permanent molars had been forming. The materials needed for building sound teeth before the birth of the child must be present in the mother's blood in sufficient quantity and suitable form. Does this not bring out pointedly the necessity of medico-dental co-operation in these matters? I believe that just as at the present time the dentist is trained to observe mouth conditions from the medical standpoint so the physician should be trained to observe dental condition, from the pre-natal period onwards, Caries, pyorrhoea alveolaris, malocclusion, poor hygiene, fistulas, infections of the Vincent's type and the presence of an insufficient number of teeth for mastication should all come within the general purview of the physician. For after all, only by this method of co-operation can we best serve the interests of our patients.

* * * *

In compliance with the request of the Bengal Council of Medical Registration the Calcutta Branch of the Indian Medical Association forwarded their remarks and suggestions on the proposed amendments to the Appendix to the Annual Medical List. These together with the recommendations of the Augmented Committee formed meanwhile by the Council and notes of the Registrar have been given along with the numbers of the Sections which correspond to those of the original already published in Vol. IV. No.9 pp 412—416 of this Journal.

[EDITOR]

Views and Recommendations of Indian Medical Association, Calcutta, on the Proposed Amendments to the Appendix to the Annual Medical List of the Bengal Council of Medical Registration.†

PART I

WARNING NOTICE.

The Indian Medical Association is of opinion that the Warning Notice, as it appears in the British Medical Register, should be reproduced without any alteration and the statement that "the Bengal Council of Medical Registration propose to apply the principles therein laid down in so far as they are relevant under Indian Enactments" should be considered sufficient for guidance of the registered practitioners of the province, that is to say, that we consider that no material change of this Section "Warning Notice" is called for.

Before going on with the individual sections a clause should be inserted clearly defining the word "unqualified". We recommend this should be as follows:—

Definition: "The word 'unqualified' whenever it occurs in this Appendix shall be used to signify non-possession of qualifications, registrable under the Bengal Medical Act, 1914."

SECTION 1—CERTIFICATES, NOTIFICATIONS, REPORTS ETC.

Augmented Committee's Recommendation.

This section should be omitted except the last paragraph. In the last para delete the words "whether relating to several matter above specified or otherwise."

* * * *

Reference invited to introductory note.

In case altered as the Committee recommend—the word "such" in the last para not proposed by the Committee to be excised should be deleted.

R. M. DAS.

We do not consider any change is necessary in this Section.

Comment:—We recommend that no paragraphs of this Section should be omitted.

The first paragraph enunciates the general nature of the Certificates, documents etc. required to be given by a registered medical practitioner and as such is an useful one.

† The Views and Recommendations of the Calcutta Branch are in italics throughout.

The second paragraph which though it contains a list of certain documents, certificates etc. some of which are not required to be given by the registered medical practitioners of this province, is nevertheless of much use in explaining further the nature of the certificates etc., which the registered medical practitioner is usually called upon to give.

The third paragraph is obviously important because it refers to the disciplinary action to which the registered medical practitioner is liable if he issues under his name and authority untrue certificates etc. It is also important that it points out that the foregoing list of documents etc. is by no means exhaustive.

Section 2—Unqualified Assistants And Covering

Augmented Committee's Recommendation.

It was suggested that the term 'attend' on the 4th line of the first and second paragraphs and the term 'unregistered' in the second para be deleted.

* * * *

Vide introductory note. Should alteration be made as the Committee suggest the clause viz. (as more particularly specified in Division I hereof) should be deleted.

R. M. Das.

This Association is of opinion that no change whatsoever of this Section is necessary.

Comment:—The word 'attend' should be retained because its meaning has been made sufficiently clear by the qualifying clause 'in respect of matters requiring professional discretion or skill'. Regarding deletion of the word 'unregistered' we favour retaining the word because we feel that medical men should in no way be encouraged to keep themselves outside the Medical Register and thereby evade its disciplinary action. We also think that perhaps even legislation is necessary to make it compulsory for a qualified medical man to register himself as a Registered Medical Practitioner before he is allowed to practise his profession.

Section 4—Dangerous Drugs

Augmented Committee's Recommendation.

To add after the words "involving an abuse of the privileges" the following 'such as may have been conferred' and delete the sentence "under the power given them by Section 29 of the Medical Act, 1858".

* * * *

Vide introductory note

R. M. Das.

The alteration suggested by the Augmented Committee may be accepted.

Section 5—Association with Unqualified Persons

Augmented Committee's Recommendation.

The words "unregistered" and "attend" be deleted.

* * * *

Vide introductory note.

R. M. Das.

No change is necessary in this Section for reasons already stated whilst considering Section 2.

Section 7—Association With Uncertified Women Practising as Midwives

Augmented Committee's Report.

It has been suggested that the whole of this section should be omitted for the moment but that it should receive consideration in the near future.

* * * *

Vide introductory note.

The existing scheme already leaves it optional to the Bengal Council to adopt it at some future date without bringing it into operation at present.

R. M. Das.

This Section should not be omitted and should be brought under operation as soon as practicable.

Comment:—There is hardly any reason why it should not at least be enforced in urban areas where superior facilities are in existence.

PART II

A Code of Medical Ethics
General Advice

Augmented Committee's Report.

It was suggested that instead of putting all this in print that it would seem more satisfactory to give a few lectures on these lines to medical students near the completion of their undergraduate course on the question of ethics in general in Medical practice.

* * * *

The lectures suggested may be enjoined on recognised schools for the edification of undergraduates but the Code of Medical Ethics is for all registered practitioners, whether graduates or undergraduates and whether registered in the past or to be registered in future. Presumably the Committee do suggest the deletion of the general advice from the Code.

R. M. Das.

We accept the suggestions as made by the Augmented Committee of the Council regarding the course of lectures to be delivered on Medical Ethics, but at the same time we favour the retention of the existing section on General Advice, in order to emphasize the value of ethical principles in the conduct of medical practice.

PART III

SOME OBJECTIONABLE PRACTICES

Augmented Committee's Recommendation.

The term "registered" should be changed to "Qualified."

SECTION 1 (c)

This Association recommends that after the word "himself" the words "or by another registered practitioner," should be deleted and the word "and" be added before the word "styling". The amended reading will thus be :—

Keeping an open shop, that is, one for the sale of medicines, medical or surgical appliances, etc. other than those prescribed by him and styling his dispensary in such a way as to cause it to be taken for a chemist's e.g. Nelson & Co., Dispensing Chemists, "etc."

Comment :—In this connection we beg to remark that we are of opinion that the shop which supplies the articles prescribed by another registered practitioner is also an open shop and as such one with which a Registered Medical Practitioner should not be allowed to be associated. We are definitely of opinion that it is this association with an open chemist's shop, more than anything else, that is tending to lower the dignity of the profession as well as precipitating it to an economic ruin.

SECTION 1 (e)

Augmented Committee's Recommendation.

1 (e) should read as follows :—

"A practitioner should not allow his name to be associated in any way with the manufacture or sale of a proprietory food or medicine or lend himself to the puffing of such articles."

We accept the recommendations as made by the Augmented Committee.

SECTION 1 (i)

Augmented Committee's Recommendation.

For General Medical Council read "Bengal Medical Council" and after the word 'association' add "for purposes of personal gain or profit".

* * * *

No objection.

Bengal Medical Council do not recognise any foreign qualifications not recognised by the General Medical Council.

R. M. DAS.

We accept the recommendations as made by the Augmented Committee.

SECTION 1 (j)

We recommend that this para should be substituted by the following :—

"Medical men should not accept appointments as Canvassers under firms concerned in the manufacture or sale of drugs, chemicals, and allied products, but there is no objection to their accepting positions as Medical Representatives, who will be concerned only with the representation of the scientific value of the products of the firms to medical men only. They should on no account try to secure orders or otherwise attempt to push the sales of medicines etc., on behalf of the firms."

Comment :—In this connection it may be mentioned that if our idea is to separate entirely the interests of the manufacturers of medical products and those of medical men, our attempt should also be directed towards preventing medical men from holding shares of such manufacturing firms as also from accepting positions in these firms as directors or as honorary members of the Advisory Board, inasmuch as an abuse of such practices can always have considerable harmful effect.

SECTION 7

Under rule 7 add—

Does the engagement of a 2nd medical attendant other than the first enable the consultant to treat the patient so long he is not called for consultation by the 2nd medical attendant? This fact should perhaps be made clear.

R. M. DAS.

We recommend that the following may be added :—

"The engagement of a second medical attendant other than the first does not enable the consultant to treat the patient so long as he is not called for consultation by the second medical attendant."

SECTION 13

13. Augmented Committee's Report.

After the word 'informed' on the 2nd line from the bottom of the paragraph add the words "by the patient."

We accept the Augmented Committee's suggestion regarding this Section.

SECTION 16

16. Augmented Committee's Report.

Line 2 should read—"it should be regarded as a duty and privilege" instead of "as a pleasure and privilege" and omit the words "his wife and children".

We are of opinion that this Section need not be changed.

Comment :—Obviously the changing of 'pleasure' to 'duty' would make no difference to those who will regard it only as 'an unpleasant duty' and after all there is no harm in considering 'wife and children' as part of self.

SECTION 23

We recommend this section be numbered 23 (a) *and the addition of another section* 23 (b) *which should be as follows:—*

"Honorary appointments:—It is not desirable that medical practitioners should accept honorary appointments in such hospitals and institutions as treat both poor and well-to-do patients free, unless they are remunerated for their services to the well-to-do patients."

Comment:—The necessity for such a clause which finds a place in the Bombay Medical Register is obvious. If the present practice of indiscriminate charity be adhered to, it will have disastrous consequences on the profession, especially on the junior rank of it who are struggling hard to keep body and soul together. After all, medical men as citizens have equal rights as others to be given a fair opportunity to earn an honest livelihood.

SECTION 25 (a) AND (b)

We recommend that this Section should be retained.

Comment:—If we are to delete this Section we would only be providing facilities for unscrupulous people to carry on business for pure personal gain without even the fear of being challenged.

SECTION 27

We recommend that this Section should be deleted.

Comment:—The word "Dr." has been closely connected with the practitioner of the western system of medicine in this country and it is well known that the minimum medical degree granted by many foreign Universities is an M.D. which is for all purposes equivalent to our Bachelor's degree. Moreover, as at present, this rule will be honoured more by its breach than by its observance, if we persist in retaining it.

AMBALA MEDICAL ASSOCIATION

The Indian Medical Association, Ambala Branch, passed the following resolution at its last meeting:—

"That the President of the Indian Medical Association, Punjab Branch be requested to make a representation to the Punjab Medical Council to nominate three licentiate members to the Council as is the case in other provinces.

"That the Punjab Medical Council be requested to keep only one register for the registered medical practitioners, removing all distinction of I.M.S., M.B.B.S., L.M.S., L.S.M.F., and I.M.D., among registered medical practitioners.

"That the Saddar Bazar Municipal Committee, Ambala, be requested to appoint lady health visitors and trained midwives to attend on ladies in family way at their residence."

JHANSI BRANCH

A meeting of the Medical Profession of Jhansi was held on September 20, 1936, when the following resolution was unanimously adopted.

"The members of the medical profession in Jhansi record their emphatic protest against the defective constitution of the Indian Medical Council, which as at present constituted is subservient to the interests of the General Medical Council of the United Kingdom.

The meeting requests the Government of India and the members of the Indian Legislative Assembly to amend the Act in the following respects so as to conform with the name, dignity and the function of the Council.

(a) The maintenance of an All-India Register of Qualified Medical Practitioners including the Licentiates.

(b) The securing of a uniform minimum standard of qualification in the medical schools and colleges of India as is prevalent in other countries.

(c) The recognition of non-Indian diplomas and degrees on principles of reciprocity only.

(d) A larger number of elected members on the Indian Medical Council with a non-official elected President."

H. N. SHIVAPURI,
Hony. Secretary.

THE TINNEVELLY DISTRICT MEDICAL ASSOCIATION

The Tinnevelly District Medical Association held its monthly meeting on Sunday the 27th

September, 1936 at Senkarankoil, a holy place of this District. 29 members attended.

After a tea party the meeting began under the presidentship of Lt.-Col. T. S. Shastry, I.M.S. The Secretary read the minutes of the monthly meeting (Presidents Function) held at the Headquarters on 29-8-1936, which were passed.

Dr. P. S. Srinivasan, L.M.P., Sub-Assistant Surgeon, Government Headquarters Hospital, Palamcottah, demonstrated the following clinical cases:

1. Penetrating wound chest.
2. Malignant tumour left thigh upper third and hobnailed lungs.

Notes of the following cases were read by Dr. P. S. Srinivasan:—

1. Perforated duodenum.
2. Malignant tumour left thigh upper third and hobnailed lungs.
3. Intussusception.
4. Penetrating wound chest.

The cases were fully discussed by members. Lt.-Col. T. S. Shastry, I.M.S., summed up the salient and important features of all the cases.

Dr. K. Rama Ayyar, M.B.B.S. (Andhra), gave an interesting lecture on "The Role of X-rays in Medicine and Surgery."

The President brought the meeting to a close by his remarks on the subjects of the learned address and proposed a vote of thanks to Dr. T. R. Srinivasa Iyenger, Selection Grade Sub-Assistant Surgeon, for his splendid arrangements.

Health Exhibition

Under the auspices of the Tinnevelly District Medical Association, in connection with its monthly meeting at Sankarenkoil, a Health Exhibition was arranged at the Board Gomathy Edward High School, Sankarankoil, on Sunday the 27th September, 1936, at 10 a.m. under the auspices of Mr. Ghulam Muhammed, B.A., Revenue Divisional Officer, Koilpatti. This is the first time that a Health Exhibition was held at Sankarankoli.

Lt.-Col. T. S. Shastry, I.M.S., the President of the Association, welcomed the guests and requested Mr. Ghulam Muhammad to open the Exhibition.

Mr. Ghulam Muhammed in declaring the Exhibition open said that such Exhibitions are very useful, instructive and beneficial to the public and school children and promised to devote his best attention hereafter to encourage Health Propaganda.

Mr. Maduranayagam, the Health Inspector, explained in Tamil the exhibited posters on the prevention and causation of tuberculosis, flies, and cholera, for the benefit of about 200 school children and public.

K. Rama Ayyar, M.B.B.S. (Andhra),
Secretary & Treasurer.

MEDICAL ASSOCIATIONS, SOCIETIES, ETC.

Medical Associations, Societies, Unions, etc., are invited to make use of this section of the Journal—EDITOR.

ALL-INDIA MEDICAL LICENTIATES' ASSOCIATION

A meeting of medical practitioners was held under the auspices of the Madras Branch of the All-India Medical Licentiates' Association, at Madras on the 19th September last.

Dr. D. V. Venkappa moved a resolution protesting against the non-inclusion of the Licentiates and other Diploma holders within the purview of the Indian Medical Council Act, thus perpetuating the caste system in the medical profession.

Dr. R. Ramanjulu Naidu seconded it and the resolution was passed unanimously.

Rao Saheb Dr. U. Rama Rao, who presided over the meeting, addressing the gathering, said that it was a happy idea that they should have thought of observing the 'Anti-Medical Council Day' as a protest against the treatment accorded by the Government of India to that large body of medical men, the Licentiates. He was sure they would keep up this protest year after year throughout the length and breadth of the land until their demands were fully satisfied. Their demands, he said, were:— representation of the L. M. P.'s in the All-India Medical Council, one member from each Province being elected by them; the deletion of the word 'higher' in the preamble of the Act occurring in 'higher qualifications'; the inclusion of the qualification of those Licentiates who had undergone a course of five years' training in any recognized institution, as was now being given in the Stanley Medical School, Madras, in the Schedule of Registrable qualifications; the raising of the L.M.P. course, throughout India, to five years, and the establishment of a College of Physicians and Surgeons in each province, on the model of the Royal College of Physicians and Surgeons, England, to examine and award diplomas.

"With regard to our representation in the Council," Dr. Rama Rao said, "the objection comes chiefly from the British Medical Council, though that august body finds no objection to include even Apothecaries in their Council and to reciprocate with Japanese medical qualifications based on a four years course. The Government of India plays second fiddle to the B. M. C. This Council was characterized by the late Sir Fazli Hussain as conducive to 'efficiency at home and honour abroad.' We should like to know where "that efficiency comes in." The interests of 25,000 medical men, who catered to the needs of the rural population, and who were put in independent charge of dispensaries in the mofussil, were being overlooked.

In the new Indian Constitution Act, he continued, representation was given to the scheduled, depressed and backward classes and they would have a hand, quite disproportionate to their numbers, in the shaping of their destinies. Then, why not the L. M. P.'s—'the so-called Harijans of the Medical Profession' claim a seat in the Indian Medical Council? The Assembly, he hoped, would come to the rescue of the L. M. P.'s and suitably amend the Act.

Dr. Rama Rao next suggested the establishment of a College of Physicians and Surgeons in each province. "The Government's objection", he said' "is solely financial but a salutary reform cannot be postponed for any length of time on financial grounds. In my humble opinion, there ought to be only two sets of medical qualifications, the Degree and the Diploma. The courses for both

ought to be for five years, and the curriculum the same. The degree holders will come through the University door while the diploma holders through the Colleges of Physicians and Surgeons. Both are eligible for Government service on the basis of competitive examination. That is the one and only means of levelling up the present inequalities and removing the caste distinction among medical men."

In conclusion, Dr. Rama Rao said:—Let me take this opportunity of telling you that the Indian Medical Association, of which I am now the President, is favourably disposed towards you and is anxious to help you in your endeavours to uplift yourselves. There is no good your standing aloof and having separate conferences. The Indian Medical Licentiates' Association should be merged into the Indian Medical Association and with the latter's sympathy and support, you can defeat the purpose of the Indian Medical Council or in other words, that of the British Medical Council, *viz.*, divide and rule.

BOMBAY MEDICAL COUNCIL

The following are extracts from a summary of the proceedings of the meeting of the Bombay Medical Council held on 7th September, 1936.

The Council proceeded to consider further the application of Mr. K. A. Nanavutty for permission to be registered under section 7 (3) of the Bombay Medical Act, VI of 1912, and decided that Government be informed that the Council is unable to recommend the grant of permission to Mr. Nanavutty to be registered under section 7 (3) of the Bombay Medical Act.

Council proceeded to consider further the application of Mr. G. S. Kasyapi, L.M. & S., for the restoration of his name to the Bombay Medical Register and resolved that sufficient time has not yet elapsed before his application for the restoration of his name to the Register can be entertained.

The Council proceeded to consider the application of Mr. R. S. Shah, M.B., B.S., of Rajkot, for the restoration of his name to the Bombay Medical Register and resolved that, in view of the information since received by the Council about Mr. Shah, his application for the restoration of his name to the Register cannot be entertained.

The Council proceeded to consider the reference from the Bihar and Orissa Council of Medical Registration regarding the report of the Sub-Committee appointed by that Council to lay down a minimum standard of qualification for purposes of registration and it was decided that, while the courses and improvements suggested by the Sub-Committee are very desirable, they would require a course of studies lasting for five years.

The Council proceeded to consider the enquiry received from the Medical Council of India on the following points:—

(i) whether Indian Nationals who have obtained medical degrees of repute in foreign countries with which there is no reciprocity with India should be granted recognition of these degrees in India?

(ii) on what basis the Nationals of such countries be recognised when they come to India?

(iii) what is the present practice in both these respects in your Council?

and decided that the Medical Council of India be informed as follows:—

(i) Indian Nationals who have obtained medical degrees of repute in foreign countries with which India has not established reciprocity should not be granted recognition of these degrees in India;

(ii) the Nationals of such countries, when they come to India, should not be recognised unless they obtain a qualification registrable by the Bombay Medical Council;

(iii) such medical qualifications possessed by both these classes of Nationals are not recognised at present for registration by the Bombay Medical Council.

The Council proceeded to consider further the draft revised Code of Medical Ethics and decided that it should be referred back to the Executive Committee for re-consideration.

The Council proceeded to consider certain suggestions received from Government regarding the proposal to institute a Provident Fund for the staff of the Council and decided that—

I. The Registrar be allowed to join the Provident Fund, whether he is a retired Government official or not;

II. So far as the Clerk is concerned, his joining the proposed Provident Fund should be voluntary;

III. The suggestion of Government, *viz.*, that the rate of contribution of subscribers be fixed at 1/16th of their pay, be accepted.

The Council proceeded to consider the following proposals made by Mr. M. N. Talati, L.C.P.S., a member of the Council:—

"That of the six nominated members, Government be requested to nominate at least two of them from the class of general medical practitioners who are not Consultants."

"That the Executive Committee shall consist of the President and five members of the Council and not six as at present."

and it was decided that the Council is not in favour of either of the proposals made by him.

The Council proceeded to consider a proposal received from Mr. M. N. Talati, L.C.P.S., a member of the Council, for the appointment of a Committee to prepare a programme for the celebration of the "Silver Jubilee" of the Council next year and it was decided that the Council is not in favour of the proposal.

The Council proceeded to consider the Annual Returns showing the results of the several Professional Examinations held in 1935, compiled in the Council's office from the Returns supplied by the Licensing Bodies pursuant to the Rules of the Council and it was decided that a copy of these Returns, indicating the failures by each of the examining bodies be forwarded to the College of Physicians and Surgeons of Bombay and that the attention of the College be drawn particularly to the results shown against the several schools affiliated to the College.

BENGAL COUNCIL OF MEDICAL REGISTRATION

Abstract of the Minutes of the meeting of the Bengal Council of Medical Registration held on the 22nd January, 1936.

1. Report on the inspection of the Jackson Medical School, Jalpaiguri, dated the 1st September, 1935 was considered and adopted and it was decided that recognition of the school be continued for the year ending April, 1937, that admission of 25 students be continued as at present and that future action would depend on the report by the Inspection Committee after their inspection at the end of 1936 or at the beginning of 1937.

2. It was decided that Government orders be awaited on the following matters:—

(a) Sanction to the Provident Fund Rules of the office.

(b) Amendment of the Bengal Medical Act, 1914.

(c) Amendment of rules under the Bengal Medical Act, 1914.

(d) Revision of the rules for the grant of leave to the Registrar.

(e) Representation of the Council and the Faculty on the Bengal Sanitary Board by a distinct member for each body.

3. The consideration of the revision of the Appendix to the Annual Medical List was postponed and it was decided that copies of the Ethical Suggestions of the Council and the proposed amendments be circulated to the Calcutta Medical Club, the Indian Medical Association and the Sub-Assistant Surgeons Association for remarks.

4. Report of the Penal and Ethical Cases Committee dated the 18th July, 1935 was considered and it as decided that Dr. Bipinbihari Gupta be warned in respect of his advertisement in the lay papers.

5. In regard to the question of powers of the Council to inspect examinations held by the State Medical Faculty of Bengal it was decided that the Advocate-General's opinion be awaited.

6. Government of Bengal Notification No. 5155—Medl. dated the 4th December, 1935 announcing the reconstitution of the Council under clauses (a) to (g) of Section 4, Bengal Medical Act, 1914, was recorded.

7. Government of Bengal Resolution No. 3296—P.N., dated the 18th December 1935 announcing that appointment of Dr. Taraknath Majumdar, L.M.S., D.P.H., F.C.S. and Dr. Abdul Majid, M.B., D.T.M., D.P.H., as representatives of the Bengal Council of Medical Registration and State Medical Faculty of Bengal on the Bengal Sanitary Board was recorded.

8. The Registrar's note regarding raising the preliminary standard of qualification for entrance to medical schools was considered and referred to a Committee consisting of:—

Dr. B. C. Roy, M.D., M.R.C.P., F.R.C.S.
Lt.-Col. Sir Hassan Suharwardy KT., M.D., D.P.H., F.R.C.S., I.T.F.
Dr. J. C. Chatterjee, L.M.S.
Dr. K. S. Ray, M.A., B.Sc., M.B., CH.B.
Dr. A. D. Mukherjee, L.M.F.

and they were requested to collaborate with a Committee appointed by the Governing Body of the State Medical Faculty of Bengal for consideration of the same question.

9. Letter No. 25534/7-2-2-35 dated the 1st October, 1935 from the Surgeon-General with the Government intimating that steps are being taken for provision of separate teachers for teaching each subject in Government Medical Schools was recorded.

10. The undermentioned gentlemen were appointed members of the Standing Committee to inspect medical schools:—

(1) Lt.-Col. T. C. Boyd, F.R.C.S., D.P.H., I.M.S.
(2) Dr. S. K. Mukerjee, D.O., D.O.M.S., F.R.C.S.
(3) Dr. K. S. Ray, M.A., B.Sc., M.B., CH.B.
(4) Dr. Santiram Chatterjee, L.M.S.
(5) Dr. A. D. Mukherjee, L.M.F.

11. The undermentioned gentlemen were appointed members of the Penal and Ethical Cases Committee:—

(1) Lt.-Col. T. C. Boyd, F.R.C.S., D.P.H., I.M.S. (*Convenor*).
(2) Lt.-Col. Sir Hassan Suhrawardy, KT., M.D., D.P.H., F.R.C.S., I.T.F.
(3) Dr. B. C. Roy, M.D., M.R.C.P., F.R.C.S.
(4) Panchanan Chatterjee, M.B., F.R.C.S.
(5) Rai Sahib Dr. Prabodhchandra Ray, L.M.P.

12 Messrs. Lovelock & Lewes were appointed auditors to audit the accounts of the Council for the year ending with the 31st March, 1936.

13. Report of the Penal and Ethical Cases Committee, dated the 19th December, 1935 was considered and adopted.

14. It was decided that the Dacca Medical School and the Lytton Medical School, Mymensingh, be inspected during the next six months.

15. It was decided that abstracts of proceedings of the Council be supplied to the Journal of the Indian Medical Association.

16. The judgment of the Deputy Magistrate of Bogra sentencing one Sriskamal Sengupta to pay a fine of Rs. 250/- or in default to undergo simple imprisonment for 6 months under Section 29 of the Bengal Medical Act, 1914, was recorded.

17. It was decided that the qualification D.T.M. (L'pool) be entered as an additional qualification against the name of Dr. Lalmohan Ghosh, M.B., in the Register of Registered Practitioners.

18. The Registrar's action in restoring names erased under Section 16 (2) of the Bengal Medical Act, 1914, was confirmed.

19. A request from the Registrar, Bihar and Orissa Council of Medical Registration for opinion on a proposed minimum standard of qualification for purposes of registration throughout India was referred to the Committee constituted under item 8.

CORRESPONDENCE

[The Editor is not responsible for views expressed in these columns.]

To The Editor,

Journal of the Indian Medical Association

Sir,

You have invited in your July Number opinion on Medical Education in India. Any attempt to suggest changes in this respect requires a preliminary survey of the general, economic and physical satus of the country and thereby assessing its medical needs *viz.* the outcome of such education.

It is well known that the country in general is poor and that the wealth of the country is very unequally distributed. The greater part of the population of the country is found in villages, the towns only constituting a small minority. This greater majority can neither afford the fees of the present day doctor with those of the necessary accompaniments of nurses etc., nor, the big profiteering of the chemist. The average parent also cannot afford the costly medical education available in this country or abroad. Besides, the young doctor with his or her heavy investments on education and the rising standard of living cannot find a suitable place for himself or herself in the poorer interior of the country; and therefore, adds to the crowd in the towns to the detriment of his or her future career and to the sufferance of the major population of the interior by thus not making his or her services available for the simple maintenance of the latter's life and health.

The prime object of medical education should be to secure enough of qualified practitioners of a type that could spread out and be useful to the whole country; and, not merely, to meet the needs of the main towns only. And after this primary need is fulfilled it should be able to produce men of scientific and academic inclinations who may contribute to the progress of medical science in general.

A scheme of medical education in India, thus, requires a thorough overhauling of the present system. Language question is, in my opinion, a formidable one in this matter. It is no use denying the fact that a good knowledge of English is essential—at least at present—for turning out good and progressive doctors and men of science. But a great deal of facility could surely be obtained in the teaching and learning of medicine if the imparting of such teaching were in the spoken Hindustani language of India. By Hindustani I do not mean "Persianized Urdu" or "Sanskritized Hindi". A selection of teachers who should be able to prepare their lecture notes from various standard books available in any language, and to impart such knowledge in the usual spoken language would be such an improvement on the present system of teaching!

Again the average student preparing to join a medical course has now to pass his Intermediate and preliminary scientific examinations. This means that he is at least 19 years of age, before he can take up the long courses in medicine. He finds himself, therefore, on qualifying, handicapped with regard to the age at which he could settle down in life, as compared with his other brethren who choose different other vocations in life. The matriculation standard of our Universities could be easily adapted to suit the preliminary requirements for admission to a medical course. Following upon matriculation, a five or six years' course in medicine in which the first two or three years are spent side by side in rather modified pre-medical and preclinical studies along with general English should be, quite satisfactory. During this period an acquaintance with the use of diagnostic instruments should be very advantageous. The student thus equipped with a good general education and knowledge of the normal should be better able to under-

stand any deviations therefrom which he meets within the clinical part of his studies. An attempt to co-operate knowledge of anatomy and physiology with morbid conditions in disease during the teaching at the clinical course should be profitably insisted on. While in the pre-clinical course, an attempt to cut down the finer details in anatomy etc. and to make the teaching of anatomy and physiology more practical and applied should be aimed at. Teaching of principles and practice of public health and essentials of psychological medicine should also form part of the clinical course.

Further, it should be very much more to the advantage of the public—which these young graduates of the future are intended to serve—if they are more thoroughly grounded into the commoner diseases and injuries met with in this country than heretofore, and if study of such indigenous methods, drugs and dietaries as have in the experience of most practitioners of the country come to be regarded as of proven value were included in the clinical part of the Curriculum.

The aim of graduate courses should not be towards specialisation but towards generalisation of a highly practical and efficient type so that young and qualified men and women may be able to render the necessary medical aid more efficiently and practically.

Facilities for higher and more detailed or specialistic studies should further be available for all such graduates without any restriction, so that, whenever they choose they could go up for higher studies and Examinations to qualify themselves for work as teachers, consultants, specialists or research workers, unlike what obtains at present. The Profession is at present divided up into so many watertight comparments with no prospect for one to be able to rise or move from one to another. This is very discouraging and can be improved upon, as noted above, by having one class of graduate studies only with optimum standards; and, allowing fullest facilities for higher qualifications later.

Admission to Medical courses at the age of 16 in place of 19, as suggested is expected to allow of an early settling in life, thereby encouraging the young graduates to accept smaller emoluments to start with and thus make themselves more available and approachable to the general public, and prepare them to settle in the interior of the country and render suitable medical aid there, thereby helping to solve both the problem of unemployment of the educated (amongst medical men) and that of rural medical aid.

I have tried to give above a rough outline of what I feel is our need of the day, *viz.*, to procure for our country, efficient and cheaper doctors who have before them the doors of progress wide open, if, and when, they may choose to take advantage of the same, by making possible admission to the medical course earlier and modifying the courses so as to turn out a uniformly practical and efficient medical service.

Yours faithfully,
Chadderghat, K. K. WAGHRAY,
Hyderabad—Dn. M.B., B.S., M.R.C.P. (LOND.)

* * * *

To THE EDITOR,

Journal of the Indian Medical Association

Dear Sir,

The Medical Association Saharanpur District Branch with full concurrence of the leading practitioners of the Saharanpur District have asked Dr. Kanhiya Lall Endlay, Vice-President of the Indian Medical Association and President of the Medical Licentiate Association, Saharanpur District Branches, to seek election in U. P. Medical Council on behalf of the Private Practitioners of the Licentiates Group of United Provinces. His election menifesto under the signatures of the leading private practitioners has already been issued to all the electors in the Provinces. In the opinion of the signatories Dr. Kanhiaya Lall Endley is the most suitable candidate for election to the council.

He has put in 29 years' practice in the independent medical profession and posseses full knowledge of the disabilities of the Medical Practitioners.

It is hoped that the Medical Practitioners of United Provinces will repose confidence in him and return him to the Medical Council by a overwhelming majority of votes.

Saharanpur, Yours faithfully,
26th Sept., 1936. R. N. BAGLEY, M.B., B.S.,

OBITUARY

DR. K. N. GHOSH, M.B., CH.B. (EDIN.)

Dr. K. N. Ghosh, M.B., CH.B. (EDIN.), one of the leading practitioners of Calcutta died at the age of 57 on 8th October, 1936. He practised for over 30 years and endeared himself to his numerous patients and colleagues.

He was associated with various public institutions of Calcutta and was an active member of the Indian Medical Association. The Calcutta Branch of the Indian Medical Association passed the following condolence resolution at a meeting of the Executive Committee held on 10th October, 1936.

"Resolved that this meeting of the Indian Medical Association, Calcutta Branch, expresses its deep sorrow at the premature death of Dr. Khagendra Nath Ghosh, a member of this Association from its inception and an ex-member of its Executive Committee, and offers its condolence to the members of the bereaved family."

ACKNOWLEDGMENT

Added to the List of Exchange (Foreign)

1. Radiology.
2. Ceska Dermatologie.
3. Psychiatric Quarterly.
4. Journal of Heredity.
5. Annali D' Igiene.

Received for Review:—

1. Pharmacopoeia of King Edward VII Memorial Hospital, Bombay.
2. A Manual of Pharmacology by W. E. Dixon published by Edward Arnold & Co., 41 & 43, Maddox Street, London W. I.
3. MacCallan's Trachoma published by Butterworth & Co. (India), Ltd., Calcutta.
4. Theory & Practice of Psychiatry published by C. V. Mosby Co., 3523-25 Pine Boulevard Street, Louis, U. S. A.